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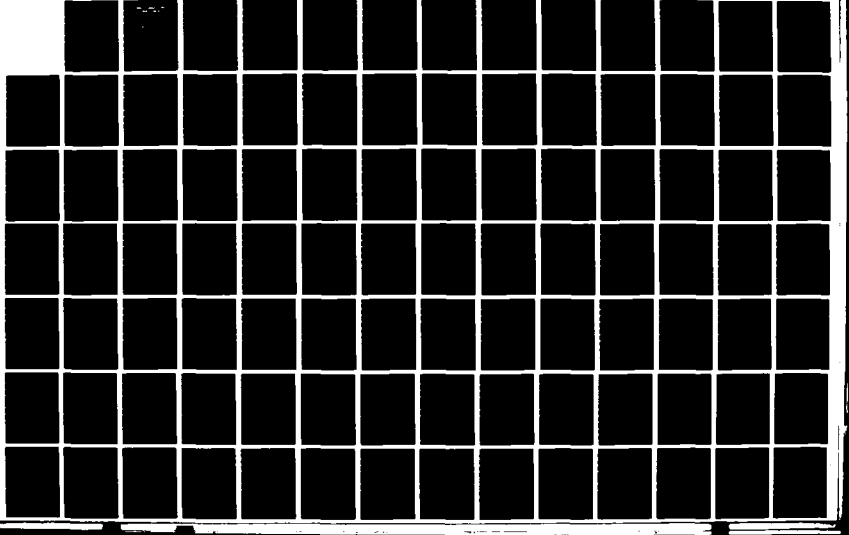

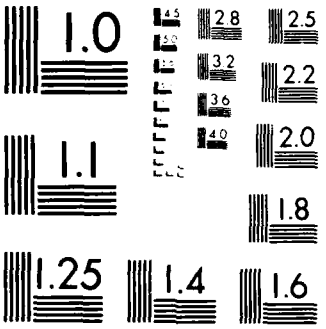

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NAVAL POSTGRADUATE SCHOOL
Monterey, California

THESIS

AN EXAMINATION OF THE OUTPORTING SHIP PROGRAM IMPLEMENTED IN RESPONSE TO THE INCREASED PROGRAM SIZE OF THE READY RESERVE FORCE

by

Joan Marie McFarland
June 1988

Thesis Advisor: Alvin F. Andrus

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This thesis is a discussion of the actions the Government has taken in response to the decline of the civiiian merchant marine fleet. Early sealift capability, a vital component of the U.S. defense strategy has deteriorated. Progresively more expansive measures have been adapted in governmental efforts to build up a strong arsenal of assets capable of responding rapidly in the event of a contingency. This thesis looks at the componenets of the strategic sealift program, the National Defense Reserve Fleet, the Ready Reserve Force and, the newest measure, the ship Outporting Program. This program was implemented to alleviate congestion at the fleet anchorages, thereby reducing the ship activation and loadout times, ensuring rapid delivery of U.S. fighting force equipement overseas. This study culminates with the presentation of data that may be used to develop a model that will appraise the effectiveness fo outporting a Ready Reserve Force ship.

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An Examination of the Outporting Ship Program Implemented in Response to the Increased Program Size of the Ready Reserve Force

by

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Lieutenant, United States Navy
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Submitted in partial fulfillment of the requirements for the degree of

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ABSTRACT

This thesis is a discussion of the actions the Government has taken in response to the decline of the civilian merchant marine fleet. Early sealift capability, a vital component of the U.S. defense strategy has deteriorated. Progressively more expansive measures have been adapted in governmental efforts to build up a strong arsenal of assets capable of responding rapidly in the event of a contingency. This thesis looks at the components of the strategic sealift program, the National Defense Reserve Fleet, the Ready Reserve Force and, the newest measure, the ship Outporting Program. This program was implemented to alleviate congestion at the fleet anchorages, thereby reducing the ship activation and loadout times, ensuring rapid delivery of U.S. fighting force equipment overseas. This study culminates with the presentation of data that may be used to develop a model that will appraise the effectiveness of outporting a Ready Reserve Force ship.

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B. BACKGROUND

The Military Sealift Command is tasked with providing this strategic sealift support. It performs its strategic sealift assignment through the use of two major sources: the U.S. Merchant Marine and Government-owned ships. U.S. Government-owned ship assets are those operated by the Military Sealift Command in peacetime or held in the custody of the Maritime Administration in the National Defense Reserve Fleet and its readily available Ready Reserve Force. Over half of the ships in the Ready Reserve Force are dispersed to commercial ports, rather than being berthed at the National Defense Reserve Fleet anchorages, to secure accessibility should the need arise for early sealift support.

The U.S. Maritime industry provides a source of sealift assets from the regularly operating U.S. flag fleet, which may be chartered or requisitioned for military use in time of war or national emergency. [Ref. 3] There is growing concern over the ability of the Merchant Marine to meet the needs of our national defense strategy. The role of the merchant marine in defense is to augment the overseas lifting capabilities of the Air Force, Navy and Marine Corps for personnel, equipment and stores, and at the same time to continue its normal role of transporting the material needed to support the national economies of the United States and its allies. So important are these roles

to the preservation of the U.S. defense strategy that the merchant marine has often been called "the fourth arm of national defense."

Doubt exists about the merchant marine's ability to support rapid deployment of the U.S. forces, while maintaining shipping lines to the U.S., because of the erratic history of the merchant marine throughout past periods of conflict. During both World Wars and, to a lesser extent, the Korean and the Vietnamese conflicts, the U.S. began each crisis with too little usable shipping to directly support the fighting forces. Massive shipbuilding efforts had to be undertaken in order to promote adequate shipping. However, in each case, once the hostilities abated, the shipping industry was allowed to lapse into chronic decline.

There is the potential for history to repeat itself. In 1986 the U.S. flag oceangoing merchant marine of about 470 ships (including 100 inactive ships as of June 1, 1986) was ranked 16th in the world in terms of number of ships. The U.S. fleet carries only some 5% of U.S. waterborne foreign trade. This means the U.S. must depend on foreign ships to carry 95 percent of American imports and exports. [Ref. 4] Given its present status, relying on ships in the merchant fleet to fulfill mobilization shipping requirements is risky.

There are two possible options that deserve study if one concurs that the declining U.S. private fleet is unable to meet the defense sealift needs. The government may (1) pursue a policy of actively supporting the merchant marine, or (2) build up a strong arsenal of government owned assets. Any maritime policy that actively supports an increase in the size of the private merchant fleet conversely lessens the need for government owned shipping assets.

1. Federal Policy

The federal government has historically supported and promoted the U.S. merchant marine on the grounds of national security. The fleet exists largely because of a web of subsidies and supports provided by U.S. law. [Ref. 5]. Shipyards received subsidies to offset lower foreign building costs. Shipowners have received subsidies to compensate for lower foreign operating costs. The US merchant fleet has benefitted from the exclusion of ships built and registered abroad from domestic U.S. ocean trade. Maritime supports were deeply cut in 1981 when the Reagan administration excluded construction subsidies from the maritime budget request. [Ref 6].

The continuing decline in the merchant fleet is being offset by a buildup of government owned assets. This is occurring at a time when the federal budget deficit is a topic of unparalleled importance. Many Department of

Defense programs are vulnerable to budget constraints and lowered funding levels. In the FY89 amended budget submission, the Department of Defense absorbed a $33 Billion reduction. The Assistant Comptroller of the Navy, RADM Seeley, [Ref. 7] noted that the Department of the Navy's "Fair Share" reduction of this total was 12.3 Billion. This leaves many programs as potential candidates for a budget cut.

As budget actions stress the importance of getting the most effective use of dollars, a closer examination is necessary of the funding requirements for maintenance of the Ready Reserve Force. One component of the Ready Reserve Force program subject to scrutiny is the Outporting Ship Program. This program was implemented to support the early sealift capability of the Ready Reserve Force. Projected costs for the Outporting Ship Program are slightly more than $10 Million per year. Under the austere funding constraints, are the costs allocated to this program justifiable?

C. SEALIFT ASSETS

1. U.S. Merchant Fleet

The merchant fleet is presently struggling with higher capital and operating costs. According to the Maritime Administration , the privately owned, deep-draft fleet of the U.S. Merchant Marine declined by 33 vessels in one year, totalling 546 vessels with a carrying capacity

of about 23 million deadweight tons on July 1, 1987. As the size of the merchant fleet declines, the importance of the Ready Reserve Force as the Department of Defense's primary source of quick response sealift increases.

2. Government Owned Fleet

When demand for sealift assets exceeds the availability of the Military Sealift Command ships and voluntary charters from U.S. flag carriers, the importance of the Ready Reserve Force increases. The rationale for maintaining a government owned fleet is the quick response capability. The Ready Reserve Force was established to provide a force of cargo ships that could be activated within five to ten days. These cargo ships have a high potential for support of military forces in a contingency situation and are upgraded and maintained in a state of readiness so that they can be relied upon to support emergencies.

The Ready Reserve Force is expanding rapidly. About 30 of the National Defense Reserve Fleet ships were classified as Ready Reserve Force ships in March 1983; the Maritime Administration Monthly Report for January 1988 shows 91 ships in the group; and it is estimated that about 116 ships will be in the Ready Reserve Force by 1991. The goal for 1992 is 120 ships. An objective of the Ready Reserve Force program is to be able to activate numerous ships

concurrently. In support of this goal, the outporting program was implemented.

Less than half of the Ready Reserve Force ships are homeported at one of the three National Defense Reserve Force sites: James River, VA; Beaumont, TX; or Suisan Bay, CA. As of 31 December 1987, 48 Ready Reserve Force ships were outported at 23 different ports. A question that has served as a guide in this research is: Does the outporting of the Ready Reserve Force ships effectively improve the early sealift capability needed to meet the urgent sealift requirements of the military services?

D. THESIS OBJECTIVE

The objective of this thesis is to examine the effect the increased program size of the Ready Reserve Force has on the dispersal of the ships. In response to the shrinking of the U.S. flag fleet, the size of the Ready Reserve Force was expanded. Consequently, the fleet anchorages became concentrated with Ready Reserve Force ships which they could not rapidly activate. To alleviate the congestion problem, the outporting program was implemented.

E. THESIS CONTENT

The following chapter discusses the strategic sealift concept, the defense strategy , the components of the sealift program and the organizational structure. Chapter 3

provides an indepth study of the Ready Reserve Force. Chapter 4 presents data on the outporting program. Chapter 5 provides a summary, conclusions and presents data that may be used to develop a logistics model to appraise the effectiveness of outporting a ship versus berthing it at an National Defense Reserve Fleet site.

II. STRATEGIC SEALIFT

A. BACKGROUND

The continuing deterioration of U.S. maritime power puts the United States' national security strategy of forward deployment and forward deterrence in a precarious situation. Between 1946 and 1986, the U.S. Merchant Marine declined from more than 3,000 ships actively engaged in U.S. oceanborne foreign trade to just 470 (370 active, 100 inactive). Less than 5% of U.S. trade is carried in U.S. flag ships. As Figures 1 and 2 illustrate, the NATO flag fleets are experiencing the same difficulties as the U.S. Merchant Marine.

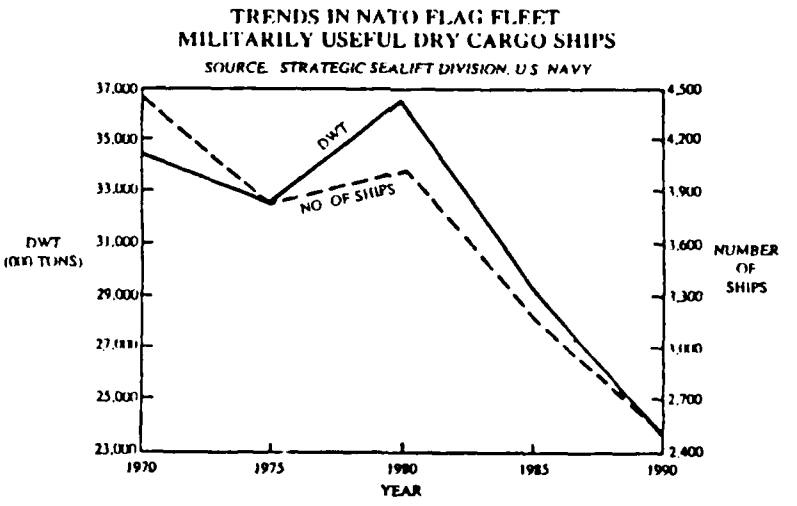


Figure 1
Trends In NATO Flag Fleet
Militarily Useful Dry Cargo Ships
[Ref. 8]

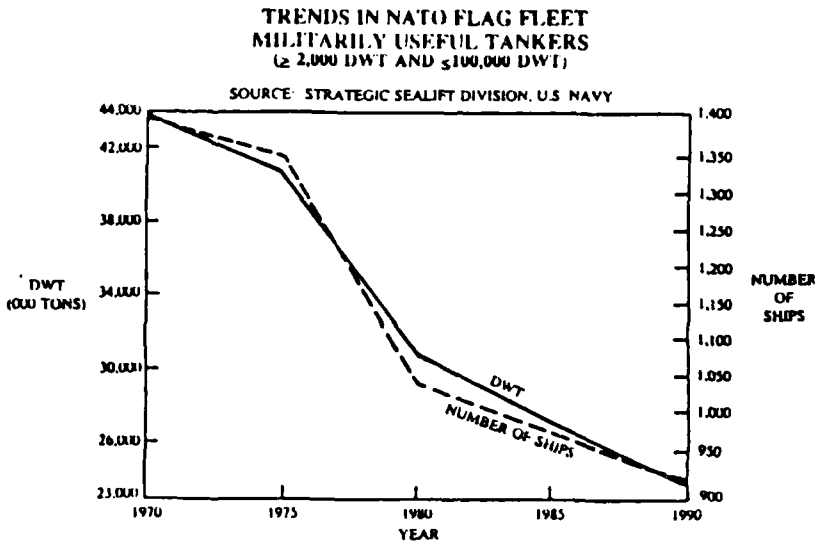


Figure 2
Trends In NATO Flag Fleet
Militarily Useful Tankers
(>2,000 DWT and <100,000 DWT)
[Ref. 8]

The flag fleet that the United States has historically relied upon to provide the sealift capability required for national defense has changed. Although there are adequate world shipping assets to satisfy this nation's commerce in peacetime, it is questionable if these assets would be made available to the U.S. in crisis or war. Figure 3 shows how the nation's ability to meet mobilization shipping requirements is graduated from a U.S. Navy ship and crew available for immediate military use to an open-charter ship obtained through profit incentive. The non-U.S. flag ships in the higher risk categories (lower right of Figure 3) do not afford the confidence required by Navy strategic sealift planners. [Ref. 8]

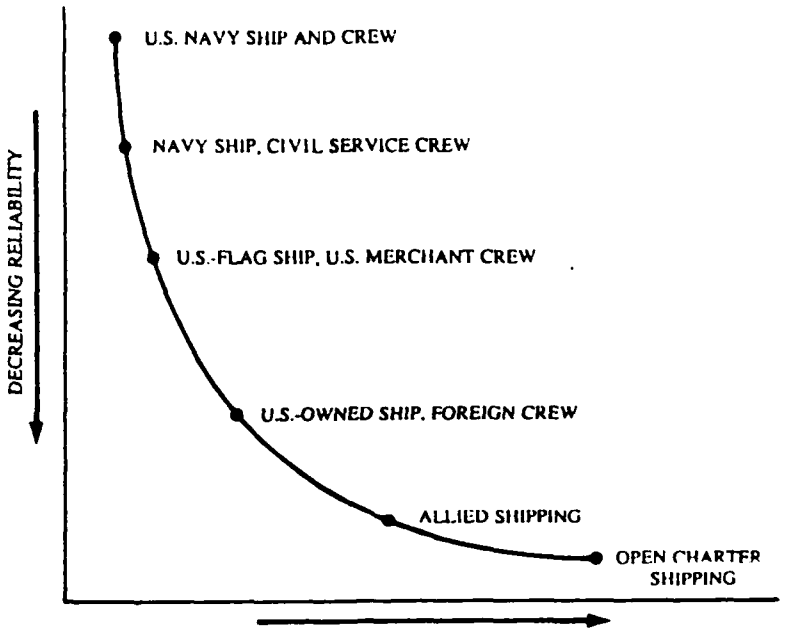


Figure 3
Ability to Meet Mobilization Requirements
[Ref. 8]

The U.S. does not have adequate strategic sealift capability, leaving it unable to meet its overseas commitments, or to satisfy the requirements of even a single theater conflict. This was the conclusion provided in testimony on 12 April 1988, to the Senate Armed Services subcommittee on projection forces and regional defense, by the head of the U.S. Transportation Command. Air Force General Duane H. Cassidy, commander-in-chief of the six month old command said: "The current inventory of ships suitable for strategic sealift is inadequate to meet the requirements of even a single theater conflict." Furthermore, he is predicting a "dramatic net decrease" in

the number of ships, merchant seaman, shipyard facilities and workers by the turn of the century [Ref. 9].

Gen. Cassidy asserted that it is presently impossible for the U.S. to meet the needs of national strategy from U.S. resources. "Everything ... points to the fact we are headed in the wrong direction in ships, shipyards and seaman." He stressed the need to revitalize the commercial maritime industry. [Ref. 9] Published projections show a requirement for an active fleet of about 600 U.S. flag ships to meet vital defense needs. [Ref. 8]

B. OBJECTIVE OF STRATEGIC SEALIFT PROGRAM

The changing realities of the U.S. merchant marine, such as fewer ships, smaller crews, containerization for economic survival, and a decreasing percentage of trade, have eroded the U.S. flag fleet's capability to meet surge Unit Equipment deployment requirements. In 1975, General Catton, USAF, [Ref. 10] noted the importance of sealift in the following remark.

> I see no advantage, possibly even military disaster, in a situation where modernized military and civilian aircraft team up to deliver a fighting force able to close with the enemy, only to find that an antiquated military and civilian sealift force cannot sustain their effort.

In 1984, the Navy officially recognized the importance of sealift capability when the Secretary of the Navy designated strategic sealift a separate and distinct Navy function, along with Sea Control and Power Projection.

Strategic Sealift is the afloat pre-positioning and the traditional ocean movement of U.S. fighting force unit equipment and sustainment in times of national emergency. The objective is to deliver the required unit equipment and sustainment where and when the CINC requires. In clarifying this role, the Chief of Naval Operations defined Strategic Sealift as "The afloat prepositioning and ocean movement of materials, petroleum, oil lubricants and personnel in support of assigned logistic support missions of the U.S. Government, including the necessary cargo handling systems and personnel to ensure delivery of cargo ashore." [Ref. 11: p. 1]

The availability of ships in the event of a contingency is an important criterion of the U.S. defense strategy. U.S. national security strategy is based upon a forward defense concept. Threats to American and U.S. allies will be countered at their sources, overseas, according to this strategy. [Ref. 13] The forward defense concept is fundamentally rooted in America's ability to project U.S. combat forces into any threatened region of the world: rapidly, efficiently, and in sufficient numbers to deny aggressors an early military advantage. This power projection function, in turn, will require the immediate deployment of strategic mobility forces - sealift, airlift, and prepositioned material - to move and sustain U.S. forces overseas [Ref. 8].

C. ELEMENTS OF THE STRATEGIC SEALIFT PROGRAM

To compensate for the decline in the merchant marine industry, the Navy is acquiring more government owned assets. Since 1984, the Navy has undertaken a rapid expansion of the government-owned Ready Reserve Force and other logistics ships. Under current plans, by the mid-1990's the U.S. Navy's Strategic Sealift Program will have 148 ships readily available to meet surge shipping requirements, most of which are in the Ready Reserve Forces, and are to be activated in 4 to 20 days in response to national emergencies.

1. Strategic Mobility Elements

Three mobility elements are required for the deployment and sustainment of U.S. forces overseas. They are sealift, airlift and prepositioning. The Navy's time-phased sealift capability program provides the ships and cargo handling systems to load, transport and offload equipment and material of U.S. military forces anywhere in the world. The Air Force is responsible for the airlift function, carrying personnel and limited amounts of high priority equipment and supplies. Airlifted troops will be integrated with equipment lifted simultaneously or prepositioned. Prepositioning is a joint responsibility of all the services.

2. Categories of Military Shipping

Sealift support for a contingency includes three categories of shipping. Listed in order of sensitivity, they are: prepositioned, surge, and resupply. Military equipment, loaded aboard ships and prepositioned in a contingency area, can be delivered rapidly to forces airlifted into the theater of operations. Surge shipping lifts the bulk of the CONUS-based equipment and initial sustaining supplies. Resupply shipping immediately follows to meet daily consumption rates and build up theater reserve stock levels. [Ref. 11]

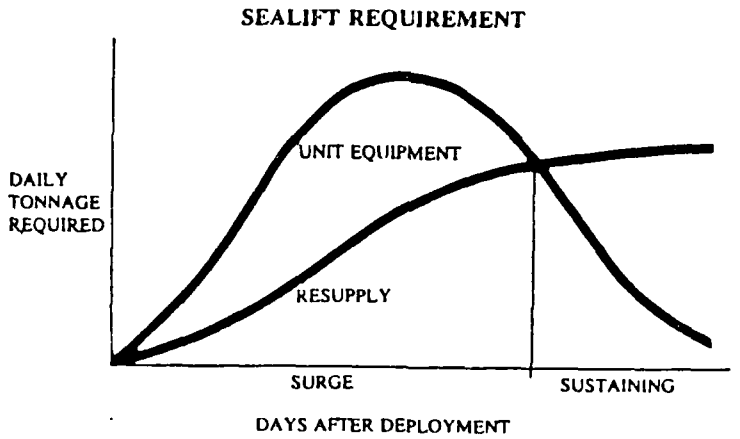


Figure 4
Time Phasing of Military Support Shipping
[Ref. 8]

Figure 4 illustrates the sequence of shipping of the two basic commodities of strategic sealift, unit equipment and sustainment, during the three phases, afloat prepositioning, surge and sustainment. As surge shipping

peaks, combat forces are delivered in-theater; resupply rates increase as force levels grow, then taper off to consumption rates, after in-theater stock levels are achieved. [Ref. 8]

Prepositioning equipment and supplies in the forward areas is the surest way of guaranteeing delivery of fully equipped forces with little or no warning time. In 1986, there were 13 ships specifically configured to remain at sea for extended periods of time. The Maritime Prepositioning Ships carry a full range of Marine Corps cargo. In total, they can carry enough supplies and equipment to support three full marine brigades (50,000 men) for 30 days. [Ref. 12]

Surge shipping augments prepositioned shipping, and is obtained from government-controlled assets, and may include vessels from commercial sources if they are available early enough. [Ref. 11] Surge efforts are planned to begin within days of a National Command Authority decision to deploy. This response is critical in order to support an overseas military operation requiring great volumes of priority combat cargo. Most surge shipping cargo consists of unit equipment such as wheeled and tracked vehicles, non-self-deployable aircraft, and limited amounts of sustaining combat supplies and ammunition.

Resupply shipping provides the bulk of sustaining support to deployed forces. Forces in the forward area of operations depend upon this shipping to replenish their daily consumption, and increase in-theater reserves to a 30-60 day level. Initial resupply shipping arrives after surge shipping and continues for the duration of a contingency. Resupply shipping is obtained from U.S. commercial sources and includes the re-use of the prepositioned ships and surge ships after their initial discharge in the theater of operations. [Ref. 11]

D. COMPONENTS OF STRATEGIC SEALIFT PROGRAM

1. Commercial & Government Controlled Assets

Commercial shipping resources are the first means of expanding sealift capability in the event of an emergency. The problem with counting entirely on this shipping in an emergency is twofold. First, the very nature of the shipping business dictates that at any particular time, company fleets will be scattered worldwide. Second, the total number of suitable U.S. flag ships is relatively small.

To illustrate this point, consider the situation on a particular day in 1975. Of the 228 privately owned general cargo ships that belonged to companies that had pledged a portion of their fleet to the Department of Defense in a less than general mobilization contingency, 56 were in/or near U.S. Atlantic/Gulf Coast ports. In a

Mediterranean or Persian Gulf contingency, the Department of Defense could reasonably only count on these ships as being available in the prescribed 5-10 days. [Ref. 14:p. 122]

The following situation further underscores the uncertainty involved over the availability of the privately owned merchant ships. On 1 January 1982, there were 244 general cargo ships in the privately owned fleet. Assume that 25%, approximately 60 ships, are at or near continental U.S. Atlantic and Gulf ports on any given day and half of this number are pledged to the Department of Defense. In this scenario, only thirty ships would be available to provide sealift capability. [Ref. 6]

When commercial and controlled fleet assets are inadequate to meet the sealift needs, the Ready Reserve Force is activated. Figure 5 illustrates the normal sequence of resource utilization.

Availability of ships after the Ready Reserve Force has been exhausted comes from the Sealift Readiness Program. Under this program, operators agree, as a precondition to bidding on defense shipments, to make a portion of their fleet available in a contingency. Historically, between 100 and 115 vessels have been pledged under the Sealift Readiness Program. [Ref. 14] However, a call-up of vessels under the Sealift Readiness Program has never been made, hence defense planning cannot rely on past

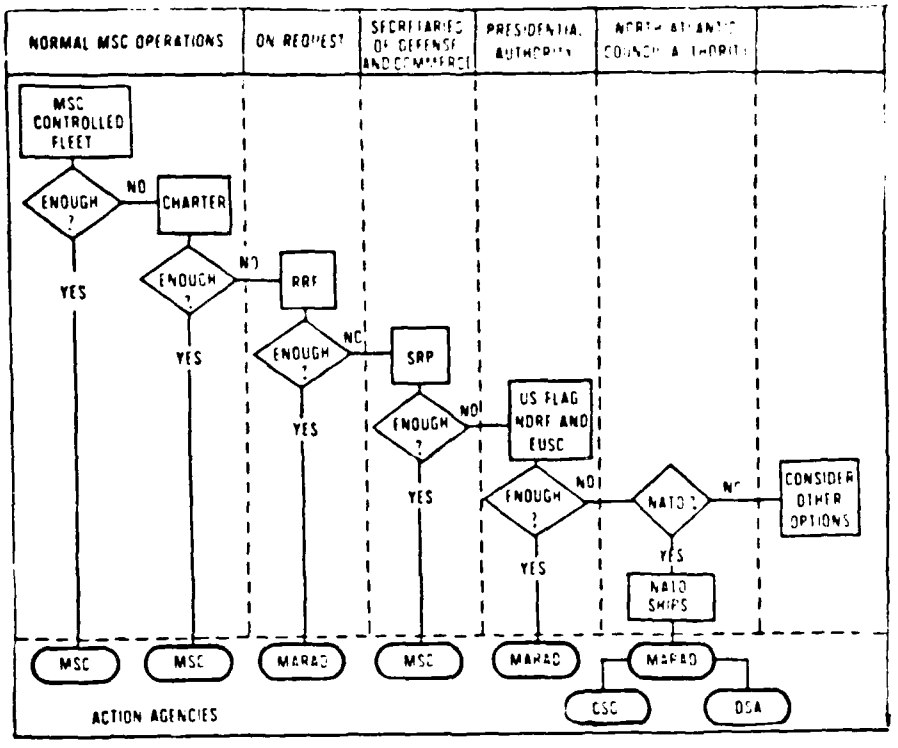


FIGURE 5
Sequence of Resource Utilization

experience. Implementation in peacetime would mean that U.S. operators would risk losing cargoes on their regular trade routes.

2. Reserve Fleet

The chief rationale for maintaining a government-owned merchant marine in peacetime is the quick response capability it presumably would have in today's world of instant crises. Historically, the military has had in-house sealift capability in times of war, but at the end of hostilities, the shipping would be retired and the relevant command(s) disbanded. However, after World War

II, the U.S. maintained and expanded its shipping capabilities.

At the end of the World War II, the U.S. government owned over 5,000 cargo vessels. To reduce the size of this government owned fleet, Congress passed the Merchant Ship Sales Act of 1946. This Act authorized the sale of these ships first to American buyers and then to foreign nationals. When it became apparent that a majority of these surplus ships would remain unsold, and consequently unused, the Act was amended so that these ships would enter a newly established National Defense Reserve Fleet. Specifically, the act [Ref. 14] stated:

> The Commission shall place in a National Defense Reserve (1) such vessels owned by it as, after consulting with the Secretary of War and the Secretary of the Navy, it deems should be retained for national defense, and (2) all vessels owned by it on December 31, 1947, for the sale of which a contract has not been made by that time...a vessel placed in such reserve shall in no case be used for commercial operations, except that any such vessel may be used during any period in which vessels may be requisitioned under Section 902 of the Merchant Marine Act of 1936, as amended.

Table 2.1 displays the growth and decline of the National Defense Reserve Fleet between 1945 and 1985. At the beginning of Fiscal Year 1945, there were 1,421 ships dispersed at nine locations. In 1950, this total peaked at 2,277 ships. However, by 1978 the National Defense Reserve Fleet had shrunk to 306 ships. As of 31 December 1987, there were 331 ships in the fleet layberthed at three locations, one on each coast.

TABLE 2.1
NATIONAL DEFENSE RESERVE FLEET: 1945-1985
[Ref. 15]

Fiscal Year	Ships	Fiscal Year	Ships
1945	5	1965	1594
1946	1421	1966	1327
1947	1204	1967	1152
1948	1675	1968	1062
1949	1934	1969	1017
1950	2277	1970	1027
1951	1767	1971	860
1952	1853	1972	673
1953	1932	1973	541
1954	2067	1974	487
1955	2068	1975	419
1956	2061	1976	348
1957	1889	1977	333
1958	2074	1978	306
1959	2060	1979	317
1960	2000	1980	303
1961	1923	1981	317
1962	1862	1982	303
1963	1819	1983	304
1964	1739	1984	386
		1985	300

Ships in the National Defense Reserve Fleet would remain idle but available for service when needed and were moored at nine different sheltered anchorages located throughout the U.S. The locations on the Atlantic Coast were: Hudson River, New York; James River, Virginia; Baltimore, Maryland and Wilmington, Delaware. The Pacific Coast locations were: Suisun Bay, California; Astoria, Oregon and Olympia, Washington. The Gulf Coast locations were at Beaumont, Texas and Mobile, Alabama.

Today, the ships of the National Defense Reserve Fleet are located at three locations. They are: James

River, Virginia; Suisun Bay, California and Beaumont, Texas. Appendix A lists the reserve ships by location, name and type.

For the most part, vessels of the National Defense Reserve Fleet are of World War II vintage. These vessels are considered of value because they are self-sustaining break-bulk type vessels. But the fact remains they are old, slow (15 knot) ships that would require 20-60 days, if not longer, to activate. As the age of the National Defense Reserve Fleet increased, the rationale that it should be maintained as a source of emergency shipping became less convincing. The most often cited problem was the time required to break out a ship, i.e., have the ship reactivated, crewed, and ready to receive cargo. It was generally accepted that the minimum breakout time was forty-five days, far too long in an era where contingencies occurred overnight and additional shipping was needed in days, not weeks. [Ref. 4] Others believed that the ships would be useful for only a one-way, one trip voyage carrying a relatively small amount of cargo. [Ref. 16: p. 61]

In 1974, the U.S. General Accounting Office investigated the National Defense Reserve Fleet as a source of emergency shipping. A report issued in 1976 concluded that the types of ships found in the reserve fleet, mainly break-bulk cargo vessels, were particularly suited to

Department of Defense emergency sealift requirements. It also found that for ships that were better preserved, breakout time could be shortened to 5 to ten days. [Ref. 17]

As a result of the General Accounting Office study, the Ready Reserve Forces; was established under a Memorandum of Understanding between the Department of Transportation and the Navy as a fully funded Navy program within the responsibility of the Military Sealift Command. During peacetime, the Ready Reserve Force is maintained by the Maritime Administration.

The Ready Reserve Force was originally co-located at the National Defense Reserve Fleet sites in James River, VA; Beaumont,TX; and Suisun Bay, CA. Originally, it was to consist of thirty ships, all Victory ships, which would provide for a high state of readiness for small fast breaking contingency situations where it was not feasible to mobilize or requisition existing U.S. flag ships. But, the Ready Reserve Force has expanded beyond the borders of the original concept. As of 1 April 1988, the Ready Reserve Force contained 93 ships. These ships comprise a cross section of the merchant fleet, ranging from former Military Sealift Command fleet oilers to large Roll On/Roll Offs. All are maintained in a 5, 10, or 20-day readiness status. Appendix B identifies the Ready Reserve Force ships by name and location. [Ref. 15]

E. ORGANIZATION

1. Military Sealift Command

When activated, the Ready Reserve Force falls under the operational control of the Military Sealift Command established in 1949. The Military Sealift Command is a U.S. Navy command with fleet status, assigned the overall mission of providing "the sealift capacity to deploy and sustain military forces anywhere in the world as rapidly and as long as operational requirements dictate, in support of national security objectives." [Ref. 19] The Commander, Military Sealift Command, reports directly to the Chief of Naval Operations, and, as executive agent for the Secretary of the Navy, is the single manager for all Department of Defense sealift. The Military Sealift Command functions as the Transportation Operating Agency for Sealift under the Joint Operations Planning System.

In both peacetime and time of crisis, the Military Sealift Command uses its own or chartered ships as well as contracting with commercial carriers to transport military cargo. It maintains its own civil service crewed controlled fleet for two reasons. One reason is to fulfill worldwide Department of Defense sealift requirements to locations where commercial carriers do not adequately meet needs. The second reason is to provide the base for a mobilization fleet in the event of a contingency.

The number of ships maintained in the Controlled Fleet each year is based upon peacetime and contingency requirements. Each year, various services submit a projection of their sealift requirements. The Defense Fuel Supply Center in Alexandria, Virginia, coordinates and projects overall military requirements for fuel and its transport. The Military Sealift Command uses the predictions to plan shipping assets requirements for the year. For example, the Military Sealift Command plans its Controlled Fleet so it can handle about 85% of anticipated tanker requirements and charter commercial tankers when necessary. If Department of Defense cargo requirements are insufficient to keep all the Controlled Fleet ships in active operation, some are put into a reserve status.

2. Maritime Administration

The Maritime Administration was created as an agency within the Department of Commerce in 1950. As a result of the signing of Public Law 97-31, on 6 August, 1981, the Maritime Administration was transferred to the Department of Transportation. [Ref. 14]

The Maritime Administration maintains the National Defense Reserve Fleet as a ready source of vessels for use during national emergencies and assists the U.S. maritime industry in fulfilling its traditional role as the Nation's fourth arm of defense in logistically supporting the military when needed.

The Ready Reserve Force is a joint program of the Maritime Administration and the Navy. The Department of the Navy provides the Maritime Administration the (1) composition, (2) outport locations , (3) specific ship features, (4) modifications and (5) ship types that should be acquired for the Ready Reserve Force; then the Maritime Administration executes the Department of the Navy guidance.

As of February 1988, funding for maintaining the Ready Reserve Force, acquiring additional ships, and all ancillary expenditures associated with the Ready Reserve Force management will be appropriated directly to the Maritime Administration. [Ref. 20] Previously, appropriations for the Ready Reserve Force program were obtained by the Navy and transferred to the Maritime Administration. The 1990 President's budget will change the functional classification of the Ready Reserve Force funding from National Defense to Transportation. [Ref. 21]

To ensure the most effective allocation of resources to meet Department of Defense sealift requirements, the Department of the Navy is instructed to cooperate fully in developing the Ready Reserve Force portion of the Maritime Administration budget request. They will continue to provide , on an annual basis, all the necessary information, including, but not limited to: number of call-ups; duration of call-ups; ship types of

call-ups; acquisition requirements; training requirements; and projected costs for the above.

III. READY RESERVE FORCE

A. COMPONENTS OF THE READY RESERVE FORCE

The Ready Reserve Force is composed of a mix of ships selected and upgraded from the National Defense Reserve Fleet and other ships acquired by the Navy or the Maritime Administration. The time-phased build-up, the total number of ships, the mix, specific ship types, positioning, and timing of future changes in the Ready Reserve Force composition is determined by the Navy, in accordance with requirement validations and budget limitations, and subject to the availability of ships as determined by the Maritime Administrator. [Ref. 22]

The ships are maintained in accordance with standards agreed to by the Commander, Military Sealift Command, and by the Maritime Administration. These specifications include, but are not limited to, the requirement that each ship enter the Ready Reserve Force in a state of good repair and preservation, fully classed by the American Bureau of Shipping, possessing current United States Coast Guard Certificate of Inspection and fully documented by the U.S. Coast Guard. The ships are maintained "In Class" as required by the American Bureau of Shipping and the U.S. Coast Guard, and in documentation by the Coast Guard. The Maritime Administration maintains the ships in such a state

that they can be activated and ready for sea within a specified time frame. These predetermined time frames, i.e., within 5, 10 or 20 days, are provided by the Military Sealift Command and assigned to each Ready Reserve Force ship. [Ref. 22]

1. Composition of the Ready Reserve Force

Within 11 years, 1976-87, the Ready Reserve Force has grown from the proposed 30 Victory ships, with a 30,000 dead- weight ton capacity, to 90 ships, with a 1,472,129 deadweight ton capacity [Ref. 18]. New ships are being entered into the Ready Reserve Force on a continuous basis. For the purposes of this paper, the status of the Ready Reserve Force was frozen as of 31 December 1987. At that time, it was comprised of 90 ships. A telephone conversation [Ref. 23] with OP-423, Strategic Sealift, on February 18, 1988 revealed that the Ready Reserve Force had expanded to 92 ships by this time; less than a month later, it was learned from Kevin Burns, [Ref. 20] Military Sealift Command, that the Ready Reserve Force had acquired another ship and now totaled 93 vessels. Appendix B groups the 90 Ready Reserve Force ships in the fleet as of December 1987 by location, and identifies their type, age and deadweight ton capacity [Ref. 18].

The original intent of the Ready Reserve Force was to provide a high state of readiness for small, fast breaking contingency situations where it was not feasible

to mobilize or requisition existing U.S. flag ships in commercial operation. [Ref. 24] As the Ready Reserve Force grew to 90 ships, the National Defense Reserve Fleet declined, from 348 to 241 ships. Table 3.1 presents the status of the U.S. Reserve Fleet on 30 December 1987.

TABLE 3.1
U.S. RESERVE FLEET ON 30 DECEMBER 1987
[Ref. 25]

Location	National Defense Reserve Fleet	Ready Reserve Force
James River	91	38
Beaumont	77	31
Suisun Bay	73	21
Total	241	90

The Ready Reserve Force is continuing to grow and it is anticipated that it will be comprised of 101 ships by the end of FY88, progressing toward the 1992 goal of 120 ships. Table 3.2 shows the projected growth of the Ready Reserve Force in the 5-year defense plan.

TABLE 3.2
FIVE YEAR PLANNING GOAL FOR THE READY RESERVE FORCE
[Ref. 26]

Ship Type	FY-88	FY-89	FY-90	FY-91	FY-92
Dry Cargo	89	94	97	100	100
Heavy Lift Ships	7	9	9	9	9
Roll-On/Roll-Off	17	17	17	17	17
Container (TACS)	8	10	12	12	12
Breakbulk	57	58	59	62	62
Tankers	12	14	15	16	20
TOTAL	101	108	112	116	120
Annual Program Growth		+7	+4	+4	+4

Although all ships in the Ready Reserve Force are assigned to a region, they are not all physically present at that location. The outporting program was implemented in 1986 due to the inability of the National Defense Reserve Fleet sites to concurrently activate the increased number of ships. The outported ships are pierside in a stand-by status in different harbors throughout the country. Two ships are located in Japan, and one is located in Hawaii.

In December,1989, 52% of the Ready Reserve Force ships were located at outports. Table 3.3 shows the number of outported Ready Reserve Force ships assigned to each region.

TABLE 3.3
OUTPORTED READY RESERVE FORCE SHIPS
[Ref. 26]

Location	RRF	Outported
James River	38	20
Beaumont	31	7
Suisun Bay	21	20
Total	90	47

2. Acquisition Procedures

The ships for the Ready Reserve Force are acquired from three sources: upgrading ships from the National Defense Reserve Fleet, ships retired from the Military Sealift Command, and direct procurement from commercial sources. Table 3.4 summarizes the acquisition methods for 106 ships placed in the Ready Reserve Force. Sixteen of these ships have been scrapped, renamed or retired into the National Defense Reserve Fleet, leaving 90 in the active Ready Reserve Force, as of December 1989.

The Navy provides the Maritime Administration with annual defense requirements pertaining to ship levels and ship mix. Based on this guidance, a Source Selection Plan is developed from their listing of current and projected vessels available to support the specified criteria. This plan provides the basic guidance to the Source Evaluation Board in preparing the solicitation and conducting the acquisition. Ships from the National Defense Reserve Fleet

TABLE 3.4
METHOD OF ACQUISITION OF RRF SHIPS
[Ref. 18]

RRF Acquisition	# of Ships	COST
Construction Differential Subsidy	36	$141,199,989
510(i)	7	10,857,150
National Defense Reserve Fleet	3	0
Transfer	13	210,000
Purchase	47	354,596,198
Total	106	492,994,803

Note: (1) Construction Differential Subsidy (CDS) - To stumulate shipbuilding in the United States, the Merchant Marine Act of 1936 provided for a construction differential subsidy, a direct subsidy that covered the difference in price between a ship built in the United States and teh price that would be paid for the same ship if built abroad. Has been pahsed out. In FY-82, no CDS funds were requested.

(2) 510 (i) - Ship owners turning in older ships were given a dollar credit toward new construction under this section of the Merchant Marine Act of 1936. [Ref. 4}

and the retired Military Sealift Command fleet are selected for inclusion in the Ready Reserve Force based upon the same criteria.

The first ship to enter the Ready Reserve Force, the Catawba Victory, was brought to a quick breakout status for about $800,000. Before a second Victory could be upgraded, however, other types of ships were being turned into the National Defense Reserve Fleet that, from a military planner's point of view, had a greater defense

utility than the Victories. These were Seatrains, C-3's, and C-4's. Ship operators turning in these older ships were given a dollar credit toward new construction under Section 510(i) of the Merchant Marine Act of 1936. As long as construction funds were appropriated by Congress, the system worked.

In 1981, when construction subsidies were cut, the problem became how to compensate the owner of a desirable candidate ship for the Ready Reserve Force. The fall-back position was to give the owner the equivalent trade-in value in scrap tonnage. For example, an operator could trade in a C-3 for the scrap value of five or six scrap candidate ships. [Ref. 4]

Another process for acquiring ships through commercial sources is through contract purchases. The Military Sealift Command contracting office issues a Request for Proposal, indicating the types of ships desired according to the priority list. Ships in excess to the needs of U.S. flag operating companies and meeting defined Ready Reserve Force requirements are given priority in the competitive procurement processes. Other ships are considered if the said priority ships are not available or are not available in sufficient numbers to satisfy the requirement, provided they can be documented under the U.S. law when the title transfers. [Ref. 22]

After 1982, the available scrap tonnage was insufficient to compensate for desired additional ships in the Ready Reserve Force. [Ref. 6] In 1982 and 1983, only six ships were placed in the Ready Reserve Force, four through a Construction Differential Subsidy , and two acquisitions were under section 510(i) of the Merchant Marine Act.

After 1983, direct purchasing became the most prevalent method for acquiring ships for the Ready Reserve Force. A total of 47 ships were purchased for the Ready Reserve Force between the purchasing of the first ship in August 1984 and the 106th ship in December 1987. Funding for the future purchase of commercial vessels for the Ready Reserve Force is contained in Table 3.5.

TABLE 3.5
FUNDING FOR READY RESERVE FORCE PURCHASES
[Ref. 27]

Fiscal Year	Amount
1988	$43.4 Million
1989	35.4 Million
1990	62.8 Million
1991	13.8 Million
1992	36.9 Million

a. Types of Ships

The types of vessels most suitable for military logistical support are Roll On/Roll Off's, Lighter Aboard Ships's (LASH), breakbulk vessels and container ships, in approximately that order. The container ships are less valuable because of their dependence on sophisticated port

facilities, which may not be available in the event of a contingency or war. Nonetheless, container ships are included in all sealift deployment plans, and efforts continue at the Department of Defense to increase their capabilities. [Ref. 4, p. 87] Less important are the tankers and the bulk carriers.

The following definitions of the types of ships in the Ready Reserve Force was provided in a briefing for the Amphibious Community. [Ref. 24]

(1) Roll-on/Roll-off (RO/RO). When used in conjunction with surge shipping, these ships are used for the initial movement of oversized combat equipment. They have the distinct advantage of fast turnaround as moving vehicles can be driven down their ramps. They normally require a developed port to discharge their cargo; however, the Navy has developed a system for use in low seas that enables vehicles to be driven onto lighterage. Most of the Roll On/Roll Off's are diesel powered and are capable of carrying about 20,000 to 30,000 deadweight tons of cargo at a speed of about 21-23 knots.

(2) Lighter Aboard Ship (LASH). LASH ships are used in sustaining military supplies or carrying unit equipment. They operate in a manner similar to the container ship, lifting the lighters or barges out of the water by means of an overhead, traveling gantry crane which will then stack the lighter atop other lighters in a cargo cell.

(3) SEABEE Ships. These ships are also used in sustaining military supplies or carrying unit equipment. With this ship, the lighters are lifted by means of an elevator and are moved to different deck levels where they are transported forward for securing. There is no height limitation placed on the cargo in a lighter. SEABEE ships carry 38 1,000-ton capacity barges which are loaded by a stern elevator.

(4) Breakbulk. This is the largest category of ships within the Ready Reserve Force. These ships are used for resupply operations. They are labor intensive

and have long load and off-load times. The advantage of breakbulk ships is their self-sustainability, the ability to discharge cargo offshore by use of ships' booms and cranes. They are also capable of handling most military cargoes. The Breakbulk's are generally faster ships with speeds in excess of 20 knots and will use steam turbines to provide the power. The capacity of these ships is about 12,000 to 14,000 deadweight tons.

(5) Auxiliary Crane Ship (TACS). These ships give non-self-sustaining ships such as container ships the capability of off-loading in a forward area. They too may be used during surge shipping. The Auxiliary Crane Ships are modified container ships outfitted with marine heavy-lift cranes. They are capable of off-loading wheeled or tracked vehicles (including the M-1 tank) and lighters up to 110 tons. When equipped with the Navy's Sealift Enhancement Features, consisting of sea sheds or flat racks, these ships are able to carry a large amount of cargo.

(6) Tankers. As of 15 April 88, the Ready Reserve Force has nine tankers for the carriage of liquid cargoes. This category is scheduled to grow to 20 ships by the end of FY92. All of the tankers are capable of carrying a mix of different types of liquid cargoes, several are also capable of carrying out underway replenishment.

(7) Troop Ship. There is only one troop ship in the Ready Reserve Force and it will be used to deliver augmenting troops to the forward theater.

b. Dead Weight Ton Capacity

As of 31 December 87, the Ready Reserve Force had 90 vessels of 1,472,129 deadweight tons (16,357-deadweight ton average) distributed as follows:

TABLE 3.6
DEADWEIGHT TON CAPACITY OF SHIPS IN THE READY RESERVE FORCE
[Ref. 18]

Number of deadweight ships	Type	Total deadweight (tons)	Average (tons)
52	Breakbulk	647,261	12,447
2	Seatrain Part. Cont.	24,604	12,302
4	LASH	140,380	35,095
3	SEABEE	115,230	38,410
4	Crane	51,868	12,967
8	Tanker	165,463	20,683
16	Roll-On/Roll-Off	306,045	19,128
1	Troopship	8,759	8,759

A 1983 Center for Naval Analysis study estimated that the average size of a new vessel in the Merchant Marine was 50,000 deadweight tons. [Ref. 28] As recent trends have been toward larger ships, this 1983 approximation is a very conservative estimate of the average size of a new vessel today. Calculations performed on the deadweight ton capacity of the ships in the Ready Reserve Force as of December 1987, show the average size to be 16,357 deadweight tons. Using these figures, one can presume that one 1983 ship can provide the sealift of 3.06 ships in the Ready Reserve Force as of December 1987. [Ref. 28]

Reviewing the age and deadweight ton capacity of the ships in the Ready Reserve Force, listed in Appendix B, a pattern becomes apparent; the older the ship, the smaller the deadweight ton capacity. Compare the American

Victory, a 43 year old breakbulk ship with 10,700 deadweight ton capacity to the 19 year old breakbulk, the Cape Nome, with 15,690 deadweight ton capacity. Or compare the 30 year old Roll On/Roll Off, the COMET, with 10,111 deadweight ton capacity to the 9 year old Roll On/Roll Off, the CAPE HORN, with 20,870 deadweight ton capacity. Over 75% of the ships in the Ready Reserve Force, as of December 1987, are 20 years or older; the overall average age 23 years.

B. COSTS

1. Program Budget

Through FY88, the Maritime Administration had only program responsibility for the Ready Reserve Force, while the Navy budgeted for most of the costs, including acquiring additional ships and providing maintenance. However, in FY-89, the funding and program management responsibility will be consolidated in the Maritime Administration. The funding will remain in the national defense function, but the administration will consult with Congress about transferring the funding to a transportation function in future budgets. The Navy will provide planning guidance annually to the Maritime Administration for use in formulating funding requirements. The guidance issued by the Navy addresses the following areas:

(1) Revised Ready Reserve Force Ship Levels and Ship Mix

(2) Ship Upgrading/Acquisitions/Deletions/Downgrading

(3) Readiness Category for Each Ready Reserve Force Ship

(4) Ship Positioning Requirements

(5) Ship Activations

(6) Training Requirements

Planning guidance issued in 1986 by the Chief of Naval Operations to the Maritime Administration for the portion of the five year defense plan pertaining to the Ready Reserve Force contained the following projected expenses:

TABLE 3.7
PLANNING GUIDANCE
[Ref. 26]

	FY-88	FY-89	FY-90	FY-91	FY-92
Maintenance	$61,406	$67,158	$50,875	$30,407	$49,161
Activation	7,259	5,962	6,000	7,259	8,296
Upgrade	6,375	0	15,411	40,562	33,392
TOTAL	75,040	73,120	72,286	78,228	90,849
Outporting	10,082	10,315	10,424	10,500	10,578
PROGRAM TOTAL	85,122	83,435	82,710	88,728	101,427

In actuality, the Maritime Administration received appropriations totalling $110,751,000 for the Ready Reserve Force in FY-89. [Ref. 29] This total is broken down into two catagories:

(1) Fleet additions.....$35,400,000

(2) Maintenance & operations.....$75,351,000

The 1989 Appendix to the 1989 FY Presidential Budget defines these activities as follows:

(1) Fleet additions - This activity provides for expansion or selective replacement of the Ready Reserve Force ships. Acquisitions will be made to provide the number and type of ships required for this program based on Department of Defense planning.

(2) Maintenance & operations - This activity provides funds for the Ready Reserve Force ship activations and deactivations required to test ship reactivation readiness and to support Department of Defense/Navy exercises of a broader purpose. The costs of ship operations will be funded by the organization requiring the ship activation. This activity also provides for maintaining the Ready Reserve Force ships in an advanced state of reactivation readiness and the associated costs of berthing ships at dispersed locations. (OUTPORTING)
Also included are special programs in support of the Ready Reserve Force and special training related to these ships such as that for radio officers and crane ship cargo handling crews. [Ref. 36]

2. Maintenance and Operations Costs

A 1983 study, done by the Center for Naval Analysis, estimated that it costs approximately $1,000,000 per year (in 1982 dollars) to keep a reserve vessel fully maintained in ready reserve status. [Ref. 28] This study speculated that this was a low estimate and claimed their experience with one particular ship, the SS OHIO, indicated an annual cost greater than $2,000,000. (Note: The SS OHIO was one of the older ships in the Ready Reserve Force.

It is a 44 year old SEATRAIN and has been transferred to the National Defense Reserve Force)

A research paper on the reactivation process for the Ready Reserve Force prepared by the same agency, the Center for Naval Analysis, in 1985, estimated a lower cost. This paper stated that ships could be maintained in the Ready Reserve Force for about $700,000 per year per ship. [Ref. 30]

A breakdown of the total maintenance costs of a ship in the Ready Reserve Force was received from the Military Sealift Command [Ref. 20]. The total cost includes the following expenses:

(1) Reserve Fleet Costs - These are the Maritime Administration associated overhead costs.

(2) General Agent Costs - The Ships Manager Fee.

(3) Service Contract - This includes such items as radar and other specialized equipment.

(4) Supply Material.

(5) American Bureau of Shipping/United States Coast Guard - Surveys and tests conducted every 4-5 years.

(6) Drydock - Conducted on a five year cycle

(7) Other materials.

(8) Painting - Conducted on a five year cycle.

Figures 6, 7, and 8 were received from the Maritime Administration and are projected annual maintenance costs for three ships in the Ready Reserve Force.

READY RESERVE FORCE (RRF) PROGRAM
PROJECTED MAINTENANCE COST ESTIMATES

Vessel SS AGENT Project MAINTENANCE Status: Day
Location JRRF Design C3-S-38a Type B/B
Region E

Year	1987	1988	1989	1990	1991	1992
Rsrve Fleet	132000	136700	137000	137400	137300	137700
General Agnt	50000	75000	75000	75000	75000	75000
Serv. Cntrct	60000	60000	60000	60000	60000	60000
Suply/Matrl	30000	30000	30000	30000	30000	30000
ABS/USCG I/R	65000	125000	85000	215000	65000	125000
Drydock	0	0	0	400000	0	0
Othr Maint/R	0	1050000	50000	50000	50000	50000
Painting	0	0	0	0	700000	0
Total	337000	1476700	437000	967400	1117300	477700

Figure 6
Projected Maintenance Costs for the SS AGENT The SS Agent is a 27 year old breakbulk ship, 11,089 deadweight tons, berthed at James River, Virginia National Defense Reserve Fleet site.
[Ref. 31]

READY RESERVE FORCE (RRF) PROGRAM
PROJECTED MAINTENANCE COST ESTIMATES

Vessel SS AIDE Project MAINTENANCE Status: Day
Location QUONSET PT., RI Design C3-S-38a Type B/B
Region E

Year	1987	1988	1989	1990	1991	1992
Rsrve Fleet	132000	136700	137000	137400	137300	137700
General Agnt	50000	75000	75000	75000	75000	75000
Serv. Cntrct	60000	60000	60000	60000	60000	60000
Suply/Matrl	30000	30000	30000	30000	30000	30000
ABS/USCG I/R	65000	125000	65000	235000	65000	125000
Drydock	0	0	0	0	400000	0
Othr Maint/R	0	210000	1210000	210000	210000	210000
Painting	0	0	0	0	400000	0
Total	337000	636700	1577000	747400	1377300	637700

Figure 7
Projected Maintenance Costs - SS AIDE
The SS Aide is a 28 year old breakbulk ship, 11,021 deadweight tons, outported at Quonset Point, R.I.
[Ref. 31]

READY RESERVE FORCE (RRF) PROGRAM
PROJECTED MAINTENANCE COST ESTIMATES

Vessel	SS CAPE DOUGLAS		Project MAINTENANCE		Status:	Day
Location	JACKSONVILLE, FL		Design RO/RO CTR		Type RO/RO CTR	
Region	E					
Year	1987	1988	1989	1990	1991	1992
Rsrve Fleet	132000	136700	137000	137400	137300	137700
General Agnt	100000	150000	150000	150000	150000	150000
Serv. Cntrct	75000	75000	75000	75000	75000	75000
Suply/Matrl	40000	40000	40000	40000	40000	40000
ABS/USCG I/R	0	0	0	0	0	0
Drydock	0	0	0	0	400000	0
Othr Maint/R	380000	430000	410000	410000	410000	410000
Painting	0	0	0	700000	0	0
Total	727000	831700	812000	1512400	1212300	812700

Figure 8
Projected Maintenance Costs - SS CAPE DOUGLAS
The SS Cape Douglas is a 15 year old Roll On/Roll Off ship, 21,398 deadweight ton capacity outported at Jacksonville, FL.
[Ref. 31]

The ships in the Ready Reserve Force operate under a contract between the Maritime Administration and individual companies. These contracts, called Ship Manager Contracts, are awarded by the Maritime Administration according to a competitive procurement process. In the maintenance costs estimates provided in Figures 6, 7 and 8, the general agent contracts for the breakbulks averaged $75000 per year, and the Roll On/Roll Off general agent fee was projected to be $150,000.

In early 1988, the Maritime Administration awarded contracts, totalling about $11.7 million in their first

year, to ten companies to maintain 71 of the ships in the Ready Reserve Force. The contracts run for five years and cover varying numbers of vessels. The names of the companies that received the contracts were published in the Journal of Commerce. [Ref. 32] Along with the name of the company, the number of ships they are to manage and the first year value of the contract was published. A example of the listings follows.

(1) American Overseas Marine Corp., Quincy, Mass, 12 ships, $1.9 million.

(2) Marine Transport Lines, Secaucus, N.J., four ships, $786,460.

(3) American President Lines, Ltd., Oakland, CA, ten ships, $1.2 million.

The duties of the Ship Manager are defined [Ref. 17] to include:

(1) Procure the ship's Master, subject to the National Shipping Authority's approval, as an agent and employee of the U.S. government.

(2) Procure and make available to the Master, for engagement by him, the officers and crew required.

(3) Equip, victual, supply, and repair the vessel.

(4) Develop activation specifications in coordination with the Maritime Administration Cognizant Regional Director and Ship Operations Officer.

(5) Hire tugboats and pilots and pay canal tolls.

(6) Appoint port agents at all ports for husbanding the ship.

(7) Relay voyage instructions directly to the Master, as may be required.

(8) Assist, as required, in obtaining all appropriate and applicable certification and documentation for

the ship, all necessary shipping documents, and all necessary port and harbor information.

The Center for Naval Analysis Research Memorandum on the reactivation process for the ships of the Ready Reserve Force estimates reactivation costs to be approximately $1.6 million per ship. [Ref. 30] The crew costs will vary, depending upon whether Navy personnel, Military Sealift Command personnel or private industry merchant seaman crews are used. Navy and Military Sealift Command crew costs are determined by military and government service pay scales. If the ships are manned with private industry merchant seamen, the Military Sealift Command must honor the shipping agreements that the maritime unions have obtained from private industry. [Ref. 30]

C. ACTIVATION PROCEDURES

1. Planning & Execution Procedures

During an exercise or crisis situation, many commands and agencies are involved in developing an operation order. The Joint Staff Officers Guide defines an operation order as " a directive, usually formal, issued by a commander to subordinate commanders for the purpose of effecting coordinated execution of an operation." [Ref. 33] The efforts of each command need to be closely coordinated so that supplies and other resources can be phased into the theater of operation in an orderly manner.

The process that authorizes the Military Sealift Command to bring ships out of the Ready Reserve Force involves a number of agencies.

a. Joint Deployment Agency

As a result of problems exposed during the Command Post Exercise Nifty Nugget of October 1979, the Joint Chiefs of Staff established the Joint Deployment Agency specifically to coordinate the planning and execution of military deployments. [Ref. 30] During peacetime, the Joint Deployment Agency participates in the deliberate development and coordination of contingency plans. During times of crisis, these plans are reviewed to see if they are applicable. Additionally, the agency coordinates and monitors time-sensitive planning and execution of force and resupply movements for deployment of CONUS-based Army and Air Force combat forces. It also coordinates and monitors deployment planning for Navy and Marine Corps forces.

b. Deliberate Planning Process

The ultimate result of the deliberate planning process is the creation of an operation plan (OPLAN), i.e., a feasible plan of operation to meet a defined threat. Plan development involves structuring the force list, determining the resupply and transportation requirements, and planning engineering and medical support. This process includes the development of the Time-Phased Force

Deployment Data computer file. This file contains all the information needed to describe a deployment. It lists what cargo is to be transported and from what port of embarkation to what port of debarkation, with a specified earliest arrival date and latest arrival date.

c. Crisis Action System

The Crisis Action System develops response actions during time-constrained operations. The time factor is the one major difference between the Deliberate Planning System and the Crisis Action System. During a crisis, an existing operation plan from the Deliberate Planning process may be applicable to the crisis after appropriate modifications or expansion.

The Joint Chiefs of Staff will then issue a warning order, a planning guidance message to the appropriate commanders and agencies, with an information copy to the Services. The order initiates an evaluation of the course(s) of action, and requests that a Commander's Estimate be submitted.

d. The Warning Order

The supported commander considers the possible course of action within the warning order, as well as courses of action developed locally. The limiting factors for each course are evaluated. These limiting factors include data about the major combat forces available and the total transportation assets. At this point, the

Transportation Operating Agencies are to provide closure estimates for each course of action. These closure estimates, produced by Military Sealift Command for the sealift requirements, correspond to the deliberate planning process's gross feasibility that is required by the Joint Chiefs of Staff. After review by the Joint Chief of Staffs and the National Command Authority, the supported commander completes the force list using actual forces, origins, and dates.

e. Execution Order

When an Execution Order is issued to initiate the execution of the operation order, the Transportation Operating Agencies develop detailed movement tables and schedules. The Military Sealift Command, in turn, determines if ships from the Ready Reserve Force are needed to fulfill those requirements. [Ref. 30]

f. Activation of the Ready Reserve Force

One or more ships may be activated to meet a sealift requirement. When the Commander, Military Sealift Command, acting as the executive agent for the Secretary of the Navy, determines that commercial and controlled fleet resources provide inadequate shipping capability, Military Sealift Command, informs the Chief of Naval Operation's Strategic Sealift Division (OP-42) of the need to call up the Ready Reserve Force vessels. OP-42 contacts the Secretary of the Navy for activation approval.

When the activation is approved, the Chief of Naval Operations tells the Military Sealift Command to activate particular ships. The Military Sealift Command informs the Maritime Administration of the exact dates when the ships are needed and when cargo loading is expected to begin. The Maritime Administration then informs the contract operators to begin the activation procedures. Once the ships are activated, they are transferred to the Military Sealift Command's administrative control and to the fleet commander's operational control. In a crisis, the specific Ready Reserve Force resource requirements would depend upon the particular OPLAN in effect.

The Ready Reserve Force ships are generally activated only pursuant to presidential Declaration of a National Emergency. However, in guidance issued by the Office of Management and Budget to the Department of Defense [Ref. 26], it was stated that these ships may be activated without this declaration and solely at the request of the Department of Defense Single Manager for Sealift for the following reasons:

(1) Testing for readiness and suitability for mission performance, including participation in scheduled exercises with exercise equipment and on both a notice and no-notice bases.

(2) Supporting civil or military contingency operations as directed by the National Command Authority.

(3) Utilizing unique capabilities to satisfy military requirements which Department of Defense and the Department of Transportation agree cannot be met by available privately-owned commercial U.S. flag ships.

2. Exercise - Breakout 87

a. Background

This exercise was the fourth MarAd Command Post Exercise conducted to test procedures for activating the Ready Reserve Force at mobilization. Each exercise has focused on different aspects of the activation process, but all are based on the premise that annual testing of the Ready Reserve Force is necessary due to the dynamic nature of the program; the continuing expansion, the new ship types, the outporting of vessels and the changes in the activation facility base.

The first exercise was held in conjunction with the NATO exercise Wintex-Cimex 83, in February 83. The Maritime Administration conducted a survey of facilities and tugboat availability, and held a Ready Reserve Force activation seminar in which 29 shipyard and 14 maritime labor organizations participated. Problems uncovered in the coordination and scheduling of activations were discussed. A critique that followed confirmed that the shipyards had adequate capacity, that seagoing manpower requirements could be met, and that adequate capability existed to distribute Ready Reserve Force ships in accordance with the schedule.

The next exercise, Breakout 85, provided interaction among the organizations involved in an Ready Reserve Force activation in order to evaluate general procedures and communications, as well as verify the capability of the activation facilities and availability of crews to man the activated ships. The crewing of the Ready Reserve Force was a particularly significant concern. The Maritime Administration regions and Ready Reserve Force fleet sites, as well as general agents, actively participated in the simulated activation processes. The principal lesson learned from this exercise was the need for improved communications.

Breakout 86 was conducted concurrently with Joint Chief of Staff exercises to simulate activation during a mobilization scenario. An analysis of activation contractors and tugboat availability were conducted, and potential problems were addressed in revised plans. Manning requirements were calculated.

Breakout-87 was conducted from 26 October, 1987 to 6 November, 1987. It was designed to provide training for Maritime Administration personnel with Ready Reserve Force responsibilities, for testing the Maritime Administration's plans and procedures for managing a total or large scale Ready Reserve Force activation, and to implement lessons-learned and recommendations from Breakout-86. [Ref. 34]

Table 3.8 shows the composition of the Ready Reserve Force at the time of each Command Post Exercise. During the span of these exercises, the net gain of the Ready Reserve Force was 59 ships. The percentage of ships distributed in the three regions drastically changed over this period. Between 1983 and 1987, the percentage of Ready Reserve Force ships distributed on the East Coast declined from 70% to 41%, the percentage of the total Ready Reserve Force distributed in the Gulf Coast increased from 20% to 34%, and the Western region increased their percentage of the total force by 13% The impact of this changed distribution on the availability of activation contractors and tugs was a prime concern for Breakout.

TABLE 8
COMPOSITION OF READY RESERVE FORCE AT EACH COMMAND POST EXERCISE
[Ref. 34]

	Total Fleet	5-Day Status	Disposition by Region East	Central	West
BREAKOUT-87	89	53	37	31	2
BREAKOUT-86	76	37	34	24	18
BREAKOUT-85	69	32	32	21	16
WINTEX-CIMEX 83	30	3	21	6	3

During this exercise, the Maritime Administration tasked its Eastern, Central and Western Regions to submit detailed Ready Reserve Force activation plans for each area of responsibility. The regions were to use the real-world status of each Ready Reserve Force

vessel at the time of notification. (Of the 89 vessels at the commencement of the exercise, 17 were in the yards undergoing repairs, 37 were at outports, 33 in fleet anchorages, 1 operating and 1 new acquisition enroute under tow. [Ref. 34]

The plans submitted by the regions took into account real world factors such as:

(1) condition & status of the ship (C-rating)

(2) required repairs, inspections, survey, etc.

(3) current repair period, type and duration

(4) location of vessel

(5) environmental factors

These plans were then submitted to the Commander, Military Sealift Command, who would subsequently order the activation and allocation of Ready Reserve Force vessels to specific missions. No actual Ready Reserve Force activations were scheduled for this exercise, however, the regions did track the activation progress of selected ships by reporting daily on milestones such as arrival at activation facility, crew aboard, plant on-line, dock and sea trials and final ready-for-sea status.

b. Conclusions

The availability of activation contractors was adequate, with 53 different contractors assigned in the Maritime Administration's activation plans. The outporting of ships and the on-berth activation offsets losses from

the shipyard base. Adequate tugboat resources were available. Outporting positively affected this factor, as only 53 ships out of the force of 89 required towing to activation locations. [Ref. 34]

This exercise concluded that the most critical element in an activation of the entire Ready Reserve Force continues to be the availability of crew members. In the exercise, it was not feasible to include maritime labor participation, therefore the objective was to determine Ready Reserve Force manning requirements for later analysis. This was accomplished by having General Agents submit updated manning lists for each of their vessels. The resulting Ready Reserve Force manpower requirement called for 3,563 seafarers on 89 ships [Ref. 34]. The average crew size on a Ready Reserve Force ship increased from 38.5 to 40.0 seafarers per ship [Ref. 20]. At the same time, most of the modern ships in the U.S. fleet regularly sail with only 21 to 24 man crews. Furthermore, foreign competitors are testing ships that require as few as 14 - 16 seafarers. [Ref. 4] This can only further reduce the U.S. manning averages in the next few years.

IV. OUTPORTING

The Ready Reserve Force is the Department of Defense's main source of quick response sealift in a contingency. Since its inception in 1976, the programmed size of the Ready Reserve Force has increased due to the shrinking size of the U.S. flag fleet. As stated earlier, within eleven years, the size of the Ready Reserve Force grew from 30 to 90 ships. Initially, the entire Ready Reserve Force was berthed at the three fleet anchorages. As these sites became more congested, it became apparent that it would not be possible to concurrently activate the increased number of ships. The anticipated improvement in early sealift capability would not be realized if the ships could not be rapidly activated.

A. BACKGROUND

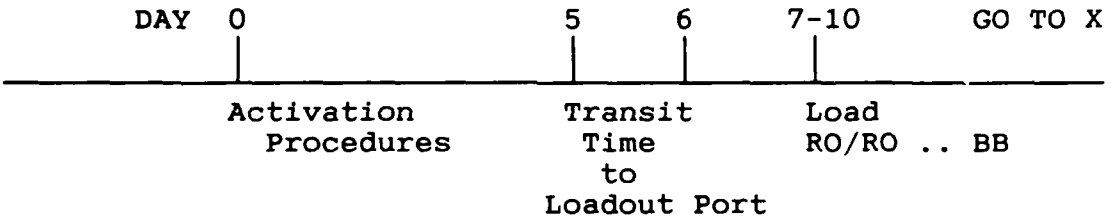
Port congestion is an all too real possibility, as history has shown. In the Spanish-American War, Tampa was designated the chief port of embarkation. However, as army historian James Huston noted, it was "hurry up and wait." Port congestion reached a point where within a few weeks a thousand railroad cars with military supplies "were backed up on sidings as far away as Columbia, S.C." [Ref. 35] In World War I, "two hundred ships lay in New York harbor awaiting cargoes and fuel while 44,320 carloads of freight

(nearly two million tons) backed up on the Atlantic seaboard as far west as Buffalo and Pittsburgh." [Ref. 35] Since World War II was a two-ocean war in which all of the nation's ports were used, congestion such as that experienced by New York in World War I did not materialize on a large scale. [Ref. 4]

Concern about the affect of port congestion on the ability of the Ready Reserve Force to provide early sealift capability was voiced in a 1986 General Accounting Office [Ref. 17] report issued to the Assistant Secretary of the Navy (Shipbuilding and Logistics). Recognizing that these problems could only intensify as the Ready Reserve Force grew in size, an outporting dispersal plan was developed. This action was to correct or eliminate fleet congestion, unberthing delays, and overburdening of shipyard labor pools because ships would be dispersed at ports throughout the United States.

B. OBJECTIVE

The outporting program was implemented to minimize the time required for the United States to activate a ship in a contingency, and to rapidly deliver U.S. fighting force equipment overseas. The following continuum illustrates the time sequence of events from the beginning of hostile actions to the arrival of the ship in the theatre of conflict.



A constraint placed on the activation process is that actions cannot begin until the Mobilization Day has been officially declared. The shipyard is not allowed to begin gathering the crew until Day 0. The majority of the outported Ready Reserve Force ships are in a five day readiness status, and they would be among the first to be marshalled after the decision to mobilize has been made.

The outporting program was designed to lessen the time needed for a ship to traverse the above continuum and, hence, decrease the closure time. Closure is defined to occur when the last unit of required cargo arrives at its destination. It is not simple to provide as there is no standard military interpretation of exactly what the definition of closure means. For example, consider the term `arrival time.' Is that when a ship arrives at the harbor, when the ship is pierside, or when the cargo is offloaded? Further, what is meant by the word `last?' Where is the line drawn for the last unit of required cargo and that used for the sustainment of troops? If a tank breaks down, does it mean the last unit never arrives? There is no closure? How does one determine closure for nonunit cargo, i.e., fuel? The Military Sealift Command

Headquarters uses a definition that rules that the unit of cargo has arrived when the ship it is loaded on arrives at the destination point. Closure is complete when 80% of the cargo has arrived. [Ref. 36]

The 1986 GAO study recognized the negative impact the berthing of all the Ready Reserve Force ships at one of three fleet sites was having on the ability to activate the ships in a timely manner. [Ref. 36] The study stated that the Maritime Administration personnel estimated that the James River Reserve Fleet could not activate more than three ships a day when 25 ships were anchored there. Recognizing these problems, the Maritime Administration awarded contracts to 15 firms to relocate 51 Ready Reserve Force ships, with most required to be activated in 5 days at over 20 locations throughout the U.S.

C. COMPONENTS OF THE OUTPORTING PROGRAM

1. Resources

The specific ships and outported locations are frequently changing. As new ships are brought into the Ready Reserve Force, the older vessels are retired into the National Defense Reserve Fleet. Appendix C identifies the outported ships, as of 31 December 1987, by name, location, type and deadweight ton capacity [Ref. 26]. At that time, 48 Ready Reserve Force ships were outported at 23 various locations. The recent trend has been to increase the percentage distribution of Ready Reserve Force ships in

the Western Region. Three tankers are now being outported overseas, two in Japan and one in Hawaii.

The data presented in this chapter is valid as of 31 December 1987, when 48 Ready Reserve Force ships were outported at 23 various ports. They were distributed as follows: [Ref. 26]

7	--	West Coast Ports
2	--	Overseas - Japan & Hawaii
3	--	Gulf Coast Ports
11	--	East Coast Ports

The types of ships outported in the three regions, East, Gulf, and West Coast, are itemized in Table 4.1.

TABLE 4.1
TYPES OF OUTPORTED SHIPS BY REGION
[Ref. 36]

TOTAL OUTPORTED	WEST	GULF	EAST	TOTAL
BREAKBULK	7		14	21
RO/RO	7	1	4	12
TROOPSHIP			1	1
TAC	2		2	4
LASH	1	3		4
SEABEE		3		3
TANKER	3			3
TOTAL	20	7	21	48

The 48 ships that were outported as of 31 December 87 had a total deadweight ton capacity of 834,836 tons, this is over half of the deadweight ton capacity provided by the entire Ready Reserve Force. The average deadweight ton capacity of the outported ships is larger than the average for all the ships in the Ready Reserve Force,

17,392 and 16,357 respectively. As ships are cycled through the Ready Reserve Force, it is the usually the newer and subsequently larger ships that are selected for outporting.

The dead weight tonnage of the outported ships is distributed as follows:

TABLE 4.2
TOTAL DEAD WEIGHT TON CAPACITY OF OUTPORTED SHIPS
[Ref. 18]

Number of ships	Type	Total DWT	Average DWT
21	Breakbulks	273,731	13,035
12	RO/RO	231,000	19,250
1	Troopship	8,759	8,759*
4	TACS	51,868	12,967*
3	Tanker	13,866	4,622
4	LASH	140,380	35,095*
3	SEABEE	115,230	38,410*

*NOTE: All ships of this type in the Ready Reserve Force are outported.

The Maritime Administration has divided the responsibility for maintaining the ships in the outporting program among three regions; the Eastern, Western and Gulf Regions. In the event of an exercise, each region submits a detailed activation plan for their area.

(1) Eastern Region. The largest percentage (44%) of the ships outported, comes from this area, and over half of the Ready Reserve Force ships maintained in this region are outported. The total amount of dead weight ton capacity is 292,554 tons. The average age of a ship in the Eastern Region is 23 years. A large number of breakbulk ships are outported in the Eastern Region.

(2) Western Region. There are 21 Ready Reserve Force ships assigned to the Western Region. Twenty of these ships are outported, leaving only one ship, a 31 year old tanker, the Shoshone, berthed at the National Defense Reserve Fleet anchorage. The total amount of deadweight ton capacity provided by ships assigned to the Western Region is 296,332 tons. The average age of ships in this region is 22 years. The slightly younger age is attributed to the quantity of Roll On/Roll Off's, which range in age from 9 to 30 years.

(3) Gulf Region. Although there are only seven Ready Reserve Force ships outported in the Gulf region, they provide 245,950 deadweight tons of capacity. The average age of these ships is 15 years. All of the older breakbulk ships assigned to this region, a total of 17, are berthed at the fleet anchorage in Beaumont, Texas.

2. Benefits of Outporting Ships

With the exception of two breakbulk ships outported in the Eastern Region and the three tankers outported overseas, all outported Ready Reserve Force Ships are maintained in a 5-day readiness status. Appendix D compares the readiness status of the outported ships to those berthed at the National Defense Reserve Fleet anchorages.

Another benefit received through the outporting of Ready Reserve Force ships is that it allows an increased number of contractors to gain experience in the reactivation process. Table 4.3 was developed during the Breakout-87 exercise and shows the number of contractors available to perform ship activations per port. This exercise had a Ready Reserve Force ship base of 89 vessels.

TABLE 4.3
SUMMARY OF VESSELS AND AVAILABLE CONTRACTORS BY PORT
[Ref. 34]

Location	Vessels	Contractors
Baltimore, MD	2	1
Beaumont, TX	17 (A)	1
Buzzards Bay, MA	1	0
Jacksonville, FL	1	3
Mobile, AL	3	2
Naragansett Bay, RI	3 (B)	4
New Orleans, LA	4	4
New York, NY	2	9
Norfolk, VA	17 (C)	8
Philadelphia, PA	4	2
Portland, ME	1	2
Portland, OR	5	3
San Francisco, CA	4 (D)	7
San Pedro, CA	2	2
Tacoma, WA	2	1
Yokohama	2	5
Total:	70	54

NOTE: Does not include 17 vessels ready in the shipyards, undergoing repair, 1 vessel operating and 1 vessel undertow.

(A) Beaumont Reserve Fleet
(B) Includes Newport, Quonset Point, and Providence, RI
(C) Includes James River Reserve Fleet
(D) Includes Suisun Bay Reserve Fleet

3. Costs

Funding for the Outporting Program falls under the Maintenance & Operations category of the Maritime Administration's Ready Reserve Force Program Budget. The FY 88 to 92 planning guidance has projected an annual outporting cost of approximately $10 million dollars [Ref. 26] The individual outporting costs per ships vary,

depending upon the specific location and type of ship. Figures 9 and 10 compare the costs of outporting two ships; the Cape Douglas, a 15 year old Roll On/Roll Off outported in Jacksonville, FL.,to the Aide, a 28 year old breakbulk outported in Quonset Point, RI.

Projected Annual Outporting Costs
Cape Douglas

READY RESERVE FORCE (RRF) PROGRAM
PROJECTED MAINTENANCE COST ESTIMATES

Vessel	CAPE DOUGLAS	Project	OUTPORTING	Status:	Day
Location	JACKSONVILLE, FL	Design		Type	RO/RO
Region	E				

Year	1987	1988	1989	1990	1991	1992
Rsrve Fleet	0	0	0	0	0	0
General Agnt	0	0	0	0	0	0
Serv. Cntrct	173740	173740	173740	173740	173740	173740
Suply/Matrl	71000	71000	71000	71000	71000	71000
ABS/USCG I/R	0	0	0	0	0	0
Drydock	0	0	0	0	0	0
Othr Maint/R	0	0	0	0	0	0
Painting	0	0	0	0	0	0
Total	244740	244740	244740	244740	244740	244740

Figure 9
Projected Annual Outporting Costs
Cape Douglas [Ref. 31]

READY RESERVE FORCE (RRF) PROGRAM
PROJECTED MAINTENANCE COST ESTIMATES

Vessel	AIDE	Project	OUTPORTING	Status:	Day
Location	QUONSET POINT, RI	Design		Type	B/B
Region	E				

Year	1987	1988	1989	1990	1991	1992
Rsrve Fleet	0	0	0	0	0	0
General Agnt	0	0	0	0	0	0
Serv. Cntrct	164733	164733	188066	164733	164733	164733
Suply/Matrl	13900	13900	13900	13900	13900	13900
ABS/USCG I/R	0	0	0	0	0	0
Drydock	0	0	0	0	0	0
Othr Maint/R	0	0	0	0	0	0
Painting	0	0	0	0	0	0
Total	178633	178633	201966	178633	178633	178633

Figure 10
Projected Annual Outporting Costs
Aide [Ref. 31]

D. CONCLUSIONS

Under this period of austere financial cutbacks, the $10 Million projected for the outporting program is vulnerable to intense scrutiny. The composition of the Ready Reserve Force, a continually increasing number of smaller and older ships, dictates that numerous berths be available for activation purposes. The three designated National Defense Reserve Fleet anchorage sites cannot concurrently activate this increased number of ships. Therefore, the expanded program size of the Ready Reserve Force will not significantly improve the early sealift capability posture of the U.S. if progressively more expansive and expensive measures, such as the Outporting Ship program, are not implemented to guarantee ship availability for surge shipping requirements.

V. SUMMARY & CONCLUSIONS

A. SUMMARY

Strategic Sealift is a vital component of the U.S. national defense strategy, and a successful strategic sealift program is dependent upon the availability of ships. The continuing decline of the U.S. merchant marine fleet has left many apprehensive about the ability of the U.S. to acquire needed ships in the event of a contingency or crisis. Particularly vulnerable in this situation is the United States's early sealift capability.

The Government has balanced the decrease in the civilian Merchant Marine fleet with an increase in the size of the Government Owned Fleet. Initially, it was felt that the private fleet would be able to accommodate surge shipping requirements. The Government-owned National Defense Reserve Fleet was viewed as a backup source of shipping capability. When the ability of the private fleet to satisfy the surge shipping requirements became doubtful, the concept of a Ready Reserve Force was developed.

When the Ready Reserve Force was implemented in 1976, the original end strength was 30 Victory Ships with a 30,000 deadweight ton capacity. This component of the Strategic Sealift Program was to be the main source of

quick response in the event of a contingency. Programmed growth has tripled since its inception in 1976.

As the quantity of ships in the Ready Reserve Force was increased, the ability of the fleet anchorages to concurrently activate the vessels became questionable. In response to this concern, the outporting program was implemented.

B. CONCLUSIONS

Outported ships are pierside in a stand-by status in different harbors throughout the country. Dispersing the ships in this manner may reduce activation and loading time, but it increases the Ready Reserve Force funding burden.

During these times of austere funding, all programs are vulnerable to financial cutbacks. The financial constraints placed on the decisions made pertaining to the number of ships to purchase, the age of the ships and where to outport them are influenced by the economic mood of the country.

Are the costs incurred due to the outporting program in times of peace offset by the benefits received in times of hostile actions, specifically, the reduction in closure time? Does outporting a Ready Reserve Force ship significantly enhance strategic early sealift capability?

There are definitive benefits gained from outporting a Ready Reserve Force ship. First and foremost, it

minimizes the congestion at the National Defense Reserve Fleet anchorages. Secondly, it spreads the demand for shipyard manpower. Third, it may eliminate the one day transit time of a Ready Reserve Force ship to its loadout point. Many outported ships are berthed at their activation site, which is also their assigned loadout point.

Once a ship is at its loadout point, it will take between seven and ten days to load, depending on the type of ship. The Roll On/Roll Off's load quickly, the breakbulks take more time. The age of the outported ships has a big impact on their ability to provide early sealift capability. The average age of the outported ships is 23 years; the average speed is 10 - 15 knots. The value of the one day saved in the transit time to the loadout point is questionable, as the ship will then slowly proceed to Point X. Conversely, it could be argued that any time saved is of value when getting the unit equipment to the destination point.

Before deciding if the outporting program is beneficial, it is necessary to decide what level of risk the nation is willing to assume pertaining to strategic sealift. The surest guarantee of ship availability is government owned ships. However, in peacetime, this detracts from government support of an active civilian merchant marine. If the decision is made to build up the

government owned fleet, how developed should that fleet be?

The present Ready Reserve Force fleet is comprised of older ships. Generally , it is the younger ships that are outported, but they still have an average age of 23 years. Newer, faster ships would have the potential to cut days from the closure model. However, these ships would be expensive to acquire, and their purchase would probably be difficult to justify to the civilian merchant marine industry.

Recent trends have been toward larger ships which have three to four times more deadweight capacity than the aging ships in the Ready Reserve Force. This means that fewer ships could carry more tonnage, and less ships would require fewer outporting sites.

There is not a simple answer. It depends on how much capital the government is willing to invest to achieve what level of risk.

C. AREAS FOR FUTURE STUDY

One area open for future study is the development of a model to determine the effectiveness of outporting a Ready Reserve Force ship versus berthing it at a National Defense Reserve Fleet site. This analysis, based on quantitative data, would determine if the closure estimates for the movement of sealift requirements between two geographical regions are significantly reduced through the outporting

of ships? The model would take into account the following characteristics:

(1) Age of Ships in the Ready Reserve Force

(2) Outported Berthing Locations

(3) Vessel Mix/Ship Characteristics

(4) Ship Load and Unload Times

(5) Distance between Ports of Embarkation

(6) Estimated Transit Times

The Military Traffic Management Command published a pamphlet that provides transportation planning information for use in strategic mobility planning. The booklet, The Logistics Handbook for Strategic Mobility Planning, [Ref 37] published in 1986, provided the following tables.

(1) TABLE 5.1 - The U.S. flag dry cargo ship inventory provides the average ship characteristic data for each class of ship in the Active and Ready Reserve Force.

(2) TABLE 5.2 - features the characteristics of ships best suited for unit deployment.

(3) TABLE 5.3 - presents data on ship load and unload times (based on a 20-hour workday) by type ship for both berth and logistics-over-the-shore (LOTS) operations.

(4) TABLE 5.4 - gives the distances from selected major CONUS ports to the larger ports in most of the coastal countries of the world in alphabetical order by country. Actual sailing distances may vary from distances given as a result of varied routing and weather conditions.

(5) TABLE 5.5 - Estimated Transit Time, may be used in conjunction with Table 5.4 to make an estimation of the transit time between a CONUS port and overseas port at selected ship speeds. The speeds are given in 8 - 30 knots; the distance is in nautical miles 50 - 12,000.

Table 5-1
AVERAGE SHIP CHARACTERISTIC DATA
(US-Flag Dry Cargo, Active and Ready Reserve Force)

Type Ship	Quantity of Ships	Avg Max Speed (KN)	Avg MTON 1/	Avg Square 2/ Feet	Avg 3/ TEUs	Max Draft (Ft)	Avg Draft (Ft)	Max Length (Ft)	Avg Length (Ft)
Breakbulk/Container	19								
Slow SS 4/ 5/	13	17.3	15,867	51,485	60	32	30	592	592
Fast SS	6	20.7	15,341	36,951	361	32	32	666	591
Breakbulk	98								
Slow	45	17.7	15,053	59,149	----	32	30	564	490
Fast	53	20.4	18,891	71,959	----	35	32	660	565
Container	94								
Slow SS	2	17.0	18,684	---	637	31	31	523	523
Fast SS	2	20.0	24,702	---	894	33	33	669	668
Slow NSS 6/	27	17.1	24,259	---	887	33	30	685	620
Fast NSS	63	22.0	38,957	---	1,310	41	33	860	716
RORO/Container	7								
Fast SS	6	22.0	38,209	131,801	1,179	34	34	692	647
Fast NSS	1	25.0	19,300	201,600	1,011	29	29	826	826
Roll-on/Roll-off	20								
Slow SS	6	18.0	26,758	115,157	---	30	26	635	585
Fast SS	9	23.3	38,184	164,466	---	32	30	791	705
Fast NSS	5	25.0	19,300	161,960	---	28	28	826	725

Table 5-1 (Cont.)
AVERAGE SHIP CHARACTERISTIC DATA
(US-Flag Dry Cargo, Active and Ready Reserve Force)

Type Ship	Quantity of Ships	Avg Max Speed (KN)	Avg MTON 1/	Avg Square 2/ Feet	Avg 3/ TEUs	Max Draft (Ft)	Avg Draft (Ft)	Max Length (Ft)	Avg Length (Ft)
LASH	18	22.0	41,329	162,624	108	41	39	894	895
SEABEE	3	20.0	46,501	103,455	320	39	39	876	876
EXseatrain	3	16.0	20,037	67,997	---	27	27	560	560

NOTE: The ship data presented in this table is for US-flag dry cargo active and Ready Reserve Force Vessels.

1/ Includes container capacities, if any.

2/ Includes container capacities except for containerships.

3/ Transportation equivalent unit (TEU represents container-carrying capacity counted in slots for 20-foot equivalent units.

4/ Slow category includes ships with speed capability less than 20 knots per hour; fast category includes ships with speeds equal to or greater than 20 knots per hour.

5/ SS denotes self-sustaining, meaning ship can discharge in stream with ship's gear.

6/ NSS denotes non-self-sustaining, meaning ships are loaded/unloaded by shore equipment; not shipboard equipment.

SOURCE: MTMCTEA (MTT-OA), January 1985

TABLE 5-2

SHIP CHARACTERISTICS FOR VESSELS BEST SUITED FOR UNIT DEPLOYMENT

	Qty	Speed (KN)	Square Feet	MTON	Cargo Dwt LTON	Max Draft (Ft)	Overall Length (Ft)	Beam (Ft)	Lighter/ Barge	Containers 20 Ft	35 Ft	40 Ft
Roll-on/Roll-off												
Adm Callaghan	1	25	167,537	49,200	9,246	29	694	92	---	---	---	---
USNS Meteor	1	20	99,270	24,456	9,592	29	540	83	---	---	---	---
USNS Comet	1	18	86,478	17,096	8,085	27	499	78	---	---	---	---
C7-S-95A	4	23	150,997	45,000	15,107	32	685	102	---	---	---	---
Great Land Class	5	24	203,134	30,000	12,555	28	791	105	---	---	---	---
Ponce Class[a]	4	25	168,300	19,300	10,323	28	700	105	---	---	---	---
Pilot Class	2	20	117,464	29,086	15,125	29	634	89	---	---	---	---
American Eagle	1	19	213,966	43,329	18,219	30	635	92	---	---	---	---
Barge Ships												
SEABEE	3	20	151,743[c]	36,618[c]	30,807	33	876	106	38	---	---	---
LASH - C8	3	22	145,784[c]	38,746[c]	24,073	41	820	100	73	118	---	---
LASH - C8	3	22	123,631[c]	37,869[c]	24,073	41	820	100	32	170	---	326
LASH - C9 Delta	3	22	174,858[c]	41,748[c]	31,994	38	893	100	60	468	---	---
LASH - C9	6	22	156,373[c]	43,387[c]	31,994	38	893	100	89	---	---	---
LASH - C8	1	22	174,858[c]	41,748[c]	24,073	41	820	100	60	468	---	---
Exseatrain												
Puerto Rico Class	3	16	67,997	20,037	9,446	27	560	68	---	---	---	---
FSS / TAKR	*8	33	217,600[b]	54,061[c]	15,360	37	946	106	---	44	86[d]	

* Updated January 1986

Table 5-2(Cont.)
SHIP CHARACTERISTICS FOR VESSELS BEST SUITED FOR UNIT DEPLOYMENT

	Qty	Speed (KN)	Square Feet	MTON	Cargo Dwt LTON	Max Draft (Ft)	Overall Length (Ft)	Beam (Ft)	Lighter/ Barge	Containers 20 Ft	35 Ft	40 Ft
RORO/Container												
Seabridge Class	4	24	158,602	22,518	11,236	34	601	90	---	834	---	---
RRF/Breakbulk												
C3-S-38A	4	18	60,477	14,807	7,807	28	493	73	---	---	---	---
C4-S-58A	6	20	61,267	16,168	8,683	31	572	75	---	---	---	---
C4-S-1H	2	20	65,605	16,957	10,503	30	564	76	---	---	---	---

FOOTNOTES:

a/ Cygnus and Lyra.

b/ 185,000 square feet of roll-on/roll-off only. An additional 25,000 square feet will be available of seasheds and flatracks when installed.

c/ Square feet and measurement tons include capacity of containers and lighters/barges.

d/ Flatracks (78) and seasheds (8).

SOURCE: MTMCTEA (MTT-OA), January 1984

Table 5-3
SHIP LOADING AND UNLOADING TIMES

TYPE SHIP	AVERAGE MTON	LOADING TIMES (DAYS)	UNLOADING TIMES (DAYS)
Breakbulk/Container			
Slow SS	15,867	4	4
Fast SS	15,341	5	5
Breakbulk			
Slow	15,053	4	4
Fast	18,891	4	4
Container			
Slow SS	18,684	1	1
Fast SS	24,702	3	3
Slow NSS	24,259	1	1
Fast NSS	38,957	1	1
RORO/Container			
Fast SS	38,209	2	2
Fast NSS	19,300	1	1
Roll-on/Roll-off			
Slow SS	26,758	1	1
Fast SS	38,184	1	1
Fast NSS	19,300	1	1
LASH/SEABEE			
LASH	41,329	2	2
SEABEE	46,501	1	1
Ex-Seatrain/TAKR			
Ex-Seatrain	20,037	3	2
TAKR	54,061	2	2

COMMENTS:

1. NSS denotes non-self-sustaining
   SS denotes self-sustaining

2. Workday consists of 20 hours

Table 5-4
DISTANCES BETWEEN PORTS

Port of Debarkation	Port of Embarkation (CONUS) Mobile Alabama	Jacksonville Florida	Norfolk Virginia	New York New York
ALASKA, Kodiak	6,321	6,467	6,730	6,925
ALBANIA, Durres	5,844	5,089	4,688	4,540
ALGERIA, Oran	4,747	3,922	3,591	3,443
ARGENTINA, Buenos Aires	6,281	5,808	5,824	5,871
AUSTRALIA, Sydney	9,088	9,234	9,497	9,692
AZORES, Ponta Delgada	3,523	2,776	2,401	2,247
BANGLADESH, Chittagong	11,177	10,422	10,021	9,873
BELGIUM, Antwerp	4,762	3,974	3,617	3,468
BERMUDA, Hamilton	1,637	956	683	697
BRAZIL, Rio de Janeiro	5,133	4,707	4,723	4,762
BRITISH HONDURAS, Belize	846	1,047	1,503	1,703
BURMA, Rangoon	11,161	10,406	10,005	9,857
CHILE, Valparaiso	4,053	4,176	4,439	4,634
CHINA, Shanghai	10,213	10,208	10,471	10,666
COLUMBIA, Buenaventura	1,789	1,912	2,175	2,370
COSTA RICA, Limon	1,292	1,589	1,852	2,047
CRETE, Souda Bay	5,974	5,219	4,818	4,670
CUBA, Guantanamo	1,109	851	1,117	1,312
CYPRES, Famagusta	6,486	5,731	5,330	5,182
DENMARK, Copenhagen	5,314	4,409	3,999	3,840
DIEGO GARCIA	9,954	9,057	8,656	8,508

Table 5-4
DISTANCES BETWEEN PORTS

Port of Debarkation	Port of Embarkation (CONUS) Mobile Alabama	Jacksonville Florida	Norfolk Virginia	New York New York
DOMINICAN REPUBLIC, Santo Domingo	1,487	1,166	1,329	1,489
EGYPT, Port Said	6,438	5,683	5,282	5,134
EL SALVADOR, Acajutla	2,270	2,493	2,656	2,851
ENGLAND, Liverpool	4,610	3,709	3,362	3,242
FRANCE, Le Havre	4,576	3,788	3,431	3,282
FRANCE, Marseilles	5,206	4,451	4,050	3,902
FINLAND, Helsinki	6,005	5,100	4,690	4,531
FRENCH GUIANA, Cayenne	2,648	2,294	2,394	2,447
GERMANY, Bremerhaven	4,960	4,182	38,25	3,676
GREECE, Piraeus	6,003	5,240	4,847	4,699
GUAM, Apra	9,312	9,548	9,811	10,006
GUATEMALA, Puerto Barrios	950	1,144	1,603	1,804
GUIANA, Georgetown	2,404	1,980	20,90	2,217
HAWAII, Honolulu	6,099	6,245	6,508	6,703
HONG KONG, Hong Kong	10,681	10,755	11,018	11,213
HONDURAS, Puerto Cortex	915	1,109	1,568	1,764
ICELAND, Reykjavik	4,001	2,565	2,677	2,495
INDIA, Bombay	9,487	8,751	8,350	8,202
IRAN, Bushehr	9,444	8,689	8,288	8,140
ISRAEL, Haifa	6,526	5,771	5,370	5,222
ITALY, Livorno (Leghorn)	5,382	4,627	4,226	4,078

Table 5-4
DISTANCES BETWEEN PORTS

Port of Debarkation	Port of Embarkation (CONUS) Mobile Alabama	Jacksonville Florida	Norfolk Virginia	New York New York
JAMAICA, Kingston	1,108	1,016	1,279	1,474
JAPAN, Yokohama	9,096	9,242	9,505	9,700
KENYA, Mombasa	9,444	8,689	8,288	8,140
KOREA, Pusan	10,284	10,430	10,693	10,888
KUWAIT, Kuwait	9,676	8,921	8,520	8,372
LEBANON, Beirut	6,529	5,774	5,373	5,225
MALAYSIA, Penang	11,171	10,416	10,015	9,867
MALTA, Marsaxlokk	5,512	4,757	4,356	4,208
MARSHALL ISLANDS, Jaluit	8,080	8,226	8,489	8,684
MEXICO, Veracruz	825	1,315	1,789	1,989
MOROCCO, Casablanca	4,495	3,740	3,339	3,191
NETHERLANDS, Rotterdam	4,965	4,179	3,622	3,473
NEW ZEALAND, Auckland	7,930	8,076	8,339	8,534
NICARAGUA, Corinto	2,320	2,243	2,506	2,701
NORWAY, Oslo	5,257	4,333	3,923	3,764
PAKISTAN, Karachi	9,303	8,548	8,147	7,999
PANAMA CANAL ZONE, Colon	1,393	1,516	1,779	1,974
PERU, Callao	2,787	2,910	3,173	3,368
PHILIPPINES, Manila	10,784	10,930	11,193	11,388
PORTUGAL, Lisbon	4,302	3,541	3,147	2,988
PUERTO RICO, San Juan	1,488	1,121	1,252	1,399

Table 5-4
DISTANCES BETWEEN PORTS

Port of Debarkation	Port of Embarkation (CONUS) Mobile Alabama	Jacksonville Florida	Norfolk Virginia	New York New York
REPUBLIC OF SOUTH AFRICA, Capetown	7,255	6,862	6,802	6,801
RUSSIA, Leningrad	5,021	5,230	4,811	4,661
RYUKYU ISLANDS, Nakagusaki	9,935	10,081	10,344	10,539
SAUDI ARABIA, Ad Dammam	9,580	8,925	8,424	8,276
SINGAPORE	11,456	10,701	10,300	10,152
SOUTH YEMEN, Aden	7,838	7,083	6,682	6,534
SPAIN, Rota	4,475	3,740	3,339	3,191
SWEDEN, Stockholm	5,883	4,826	4,416	4,257
TAIWAN, Tan-Shui	10,242	10,388	10,651	10,846
THAILAND, Ban Satlahip	11,870	11,115	10,714	10,566
TRINIDAD, Port of Spain	2,004	1,685	1,799	1,939
TUNISIA, Bizerte	5,264	4,509	4,108	3,960
TURKEY, Iskenderum	6,549	5,794	5,393	5,182
URUGUAY, Montevideo	6,115	5,727	5,710	5,753
VENEZUELA, LaGuaira	1,800	1,527	1,687	1,848
VIETNAM, Saigon	11,515	11,350	10,949	10,801
VIRGIN ISLANDS, St. Thomas	1,558	1,181	1,296	1,434
YUGOSLAVIA, Rijeka	6,183	5,388	4,987	4,839

Table 5-5
ESTIMATED TRANSIT TIMES
(Speed in Knots)

Distance Nautical Miles	08 Days-Hours	09 Days-Hours	10 Days-Hours	11 Days-Hours	12 Days-Hours	13 Days-Hours	14 Days-Hours	15 Days-Hours	16 Days-Hours	17 Days-Hours
50	0-6	0-6	0-5	0-5	0-4	0-4	0-4	0-3	0-3	0-3
100	0-13	0-11	0-10	0-9	0-8	0-8	0-7	0-7	0-6	0-6
200	1-1	0-22	0-20	0-18	0-17	0-15	0-14	0-13	0-13	0-12
300	1-14	1-9	1-6	1-3	1-1	0-23	0-21	0-20	0-19	0-18
400	2-2	1-20	1-16	1-12	1-9	1-7	1-5	1-3	1-1	1-0
500	2-15	2-8	2-2	1-21	1-18	1-14	1-12	1-9	1-7	1-5
600	3-3	2-19	2-12	2-7	2-2	1-22	1-19	1-16	1-14	1-11
700	3-16	3-6	2-22	2-16	2-10	2-6	2-2	1-23	1-20	1-17
800	4-4	3-17	3-8	3-1	2-19	2-14	2-9	2-5	2-2	1-23
900	4-17	4-4	3-18	3-10	3-3	2-21	2-16	2-12	2-8	2-5
1,000	5-5	4-15	4-4	3-19	3-11	3-5	2-23	2-19	2-15	2-11
2,000	10-10	9-6	8-8	7-14	6-23	6-10	5-23	5-13	5-5	4-22
3,000	15-15	13-21	12-12	11-9	10-10	9-15	8-22	8-8	7-20	7-8
4,000	20-20	18-12	16-16	15-4	13-21	12-20	11-22	11-3	10-10	9-19
5,000	26-1	23-4	20-20	18-23	17-9	16-1	14-21	13-21	13-1	12-6
6,000	31-6	27-19	25-0	22-17	20-20	19-6	17-21	16-16	15-15	14-17
7,000	36-11	32-10	29-4	26-12	24-7	22-11	20-20	19-11	18-6	17-4
8,000	41-16	37-1	33-8	30-7	27-19	25-16	23-20	22-5	20-20	19-15
9,000	46-21	41-16	37-12	34-2	31-6	28-21	26-19	25-0	23-11	22-1
10,000	52-2	46-8	41-16	37-22	34-18	32-2	29-18	27-18	26-2	24-12
11,000	57-7	50-23	45-20	41-16	38-5	35-7	32-18	30-13	28-16	26-23
12,000	62-12	55-14	50-0	45-10	41-16	38-12	35-18	33-8	31-6	29-10

Table 5-5 (Cont.)
ESTIMATED TRANSIT TIMES

Distance Nautical Miles	18 Days-Hours	19 Days-Hours	20 Days-Hours	21 Days-Hours	22 Days-Hours	23 Days-Hours	24 Days-Hours	25 Days-Hours	30 Days-Hours
50	0-3	0-3	0-3	0-2	0-2	0-2	0-2	0-2	0-2
100	0-6	0-5	0-5	0-5	0-5	0-4	0-4	0-4	0-3
200	0-11	0-11	0-10	0-10	0-9	0-9	0-8	0-8	0-7
300	0-17	0-16	0-15	0-14	0-14	0-13	0-13	0-12	0-10
400	0-22	0-21	0-20	0-19	0-18	0-17	0-17	0-16	0-13
500	1-4	1-2	1-1	1-0	0-23	0-22	0-21	0-20	0-17
600	1-9	1-8	1-6	1-5	1-3	1-2	1-1	1-0	0-20
700	1-15	1-13	1-11	1-9	1-8	1-6	1-5	1-4	0-23
800	1-20	1-16	1-15	1-14	1-12	1-11	1-9	1-8	1-3
900	2-2	1-23	1-21	1-19	1-17	1-15	1-14	1-12	1-6
1,000	2-8	2-5	2-2	2-0	1-21	1-19	1-18	1-16	1-9
2,000	4-15	4-9	4-4	3-23	3-19	3-15	3-11	3-8	2-19
3,000	6-23	6-14	6-6	5-23	5-16	5-10	5-5	5-0	4-4
4,000	9-6	8-19	8-8	7-22	7-14	7-6	6-23	6-16	5-13
5,000	11-14	10-23	10-10	9-23	9-11	9-1	8-16	8-8	6-23
6,000	13-21	13-1	12-12	11-22	11-9	10-21	10-10	10-0	8-8
7,000	16-5	15-6	14-14	13-22	13-6	12-16	12-4	11-16	9-17
8,000	18-12	17-10	16-16	15-21	15-4	14-12	13-21	13-8	11-3
9,000	20-19	19-18	18-18	17-21	17-1	16-7	15-15	15-0	12-12
10,000	23-4	21-22	20-20	19-20	18-22	18-2	17-18	16-16	13-22
11,000	25-11	24-0	22-22	21-20	20-20	19-22	19-2	18-8	15-7
12,000	27-18	26-2	25-0	23-20	22-18	21-18	20-20	20-0	16-16

This data will allow one to develop an objective model that can determine if it is more effective to outport a Ready Reserve Force ship than it is to layberth the entire fleet at the National Defense Reserve Fleet anchorage sites. If the make-up of the Ready Reserve Force is to remain the same, comprised of smaller and older ships requiring numerous berths for activation purposes, and financial considerations emphasize the minimization of cost, then an examination of the reduction in closure time gained through the outporting of a Ready Reserve Force ship versus berthing it at an National Defense Reserve Fleet site is appropriate.

APPENDIX A

SOURCE: NATIONAL DEFENSE RESERVE FLEET SPECIAL SUMMARY REPORT - MARAD, SHIPS IN THE NATIONAL DEFENSE RESERVE FORCE, AS OF 31 DECEMBER 1987

SUISON BAY

Name	Type	Name	Type
ADELPHI VICTORY	Freighter	AMERICAN RACER	Freighter
ALFRED VICTORY	Freighter	AMERICAN RELIANCE	Freighter
BARNARD VICTORY	Freighter	BAY	Freighter
BARRE VICTORY	Freighter	PRESIDENT	Freighter
BEREA VICTORY	Freighter	LINCOLN	Freighter
BERKELEY VICTORY	Freighter	CAPE BORDA*	Freighter
BUCKNELL VICTORY	Freighter	CAPE BRETON*	Freighter
CENTRAL VICTORY	Freighter	CAPE BON*	Freighter
COUNCIL BLUFFS VICTORY	Freighter	CAPE BOVER*	Freighter
DEPAUW VICTORY	Freighter	CAPE BLANCO*	Freighter
EARLHAM VICTORY	Freighter	CALIFORNIA*	Freighter
GREAT FALLS VICTORY	Freighter	AUSTRAL LIGHTNING*	Lash
GROVE CITY VICTORY	Freighter	AMERICAN VETERAN	Lash
HAMILTON VICTORY	Freighter	CAPE DUCATO*	RO/RO
HANNIBAL VICTORY	Freighter	CAPE EDMONT* (ex-PARALLA)	RO/RO
HOPE VICTORY	Freighter	CAPE HORN*	RO/RO
HUNTER VICTORY	Freighter	JUPITER*	RO/RO
LAHAINA VICTORY	Freighter	CAPE ISABEL*	RO/RO
LAKEWOOD VICTORY	Freighter	AMERICAN MONARCH	Part. Cont.
LANE VICTORY	Freighter	AMERICAN SPITFIRE	Part. Cont.
LAS VEGAS VICTORY	Freighter	AMERICAN TITAN	Part. Cont.
LINDENWOOD VICTORY	Freighter	SANTA MARIA	Cont. Pass.
LOYOLA VICTORY	Freighter	CONNECTICUT	Tanker
MALDEN VICTORY	Freighter	FLORENCE	Tanker
MASSILLION VICTORY	Freighter	EXXON GETTYSBURG	Tanker
MAYFIELD VICTORY	Freighter	SAGAMORE	Tanker
MERCER VICTORY	Freighter	WYONDOT	Freighter
MEREDITH VICTORY	Freighter	COMET*	Freighter
MUHLENBERG VICTORY	Freighter	TULARE	Freighter
NASHUA VICTORY	Freighter	NORTHERN LIGHT*	Freighter
OCALA VICTORY	Freighter	METEOR*	Freighter
OCCIDENTAL VICTORY	Freighter	ALATNA*	Tanker
PACIFIC VICTORY	Freighter	CHATTAHOOCHEE*	Tanker

PAN AMERICAN VICTORY	Freighter	NODAWAY*	Tanker
PURDUE VICTORY	Freighter	MISSION SANTA YNEZ	Tanker
QUEENS VICTORY	Freighter	ASHTABULA	Tanker
RED OAK VICTORY	Freighter	TALUGA	Tanker
RIDER VICTORY	Freighter	SHOSHONE*	Tanker
SIOUX FALLS VICTORY	Freighter	GEN. JOHN HOPE	Transports
ST. AUGUSTINE VICTORY	Freighter	GEN. EDWIN D. PATRICK	Transports
SWARTHMORE VICTORY	Freighter	COLONIAL	LSD
WINTHROP VICTORY	Freighter	TIOGA COUNTY	LST
BRAZIL VICTORY	Freighter	WAHKIAKUM COUNTY	LST
ELMIRA VICTORY	Freighter	GLOMAR EXPLORER	AG
AMERICAN CHARGER	Freighter	BIDDLE	Dredge
PIONEER CONTENDER	Freighter	GEM STATE*	T-ACS-2
PIONEER MOON	Freighter	GRAND CANYON STATE*	T-ACS

*Ready Reserve Force (RRF) Vessels

RO/RO - Roll-On/Roll-Off

JAMES RIVER

LAKE*	Freighter	NEW CASTLE VICTORY	Freighter
PRIDE*	Freighter	OBERLIN VICTORY	Freighter
SCAN*	Freighter	OSHKOSH VICOTRY	Freighter
MORMACGLEN	Freighter	RICE VICTORY	Freighter
CAPE CANAVERAL*	Freighter	ROSWELL VICTORY	Freighter
CAPE CANSO*	Freighter	SOUTHWESTERN VICTORY	Freighter
CAPE CATOCHE*	Freighter	TULANE VICTORY	Freighter
CAPE CARTHAGE*	Freighter	VANDERBILT VICTORY	Freighter
AIDE*	Freighter	WAYNE VICTORY	Freighter
AGENT*	Freighter	CARROLL VICTORY	Freighter
ADVENTURER*	Freighter	JOPLIN VICTORY	Freighter
AMBASSADOR*	Freighter	LOMA VICTORY	Freighter
BANNER*	Freighter	SELMA VICTORY	Freighter
BUILDER	Freighter	SHARON VICTORY	Freighter
COURIER*	Freighter	JOHN W. BROWN	Freighter
COMMERCE	Freighter	ARTHUR M. HUDDELL	Freighter
EXPORT CHALLENGER	Freighter	CAPE DECISION*	RO/RO
SANTA BARBARA*	Freighter	CAPE DIAMOND*	RO/RO
SANTA CLARA*	Freighter	CAPE DOMINGO*	RO/RO
SANTA CRUZ*	Freighter	CAPE DOUGLAS*	RO/RO
SANTA ELENA*	Freighter	CAPE HENRY*	RO/RO
SANTA ISABEL*	Freighter	CAPE HUDSON*	RO/RO
SANTA LUCIA*	Freighter	CAPE LAMBERT*	RO/RO
CRACKER STATE	Freighter	PATRIOT STATE*	School Ship
MARINER			
MORMACWAVE	Freighter	RANKIN	Freighter
MORMACTIDE	Freighter	VERMILLION	Freighter
MORMACSEA	Freighter	COMPASS ISLAND	Freighter
MORMACSAGA	Freighter	YANCEY	Freighter
AMERICAN CHALLENGER	Freighter	MARINE FIDDLER	Freighter
AMERICAN CHIEFTAIN	Freighter	MIRFAK	Freighter
AMERICAN CORSAIR	Freighter	GEN. HOYT S. VANDENBERG	Freighter
CAPE ALAVA*	Freighter	SOUTHERN CROSS*	Freighter
CAPE ALEXANDER*	Freighter	ALGOL	Freighter
CAPE ANN*	Freighter	MULIPHEN	Freighter
CAPE ARCHWAY*	Freighter	ADM. WM. M. CALLAGHAN*	Freighter
CAPE AVINOF*	Freighter	SAUGATUCK	Tanker
AMERICAN RANGER	Freighter	MARIAS	Tanker
MORMACDAWN	Freighter	AUCILLA	Tanker
MORMACMOON	Freighter	ATAKAPA	Tug
SHIRLEY LYKES	Freighter	MOSOPELIA	Tug
CAPE NOME*	Freighter	GEN. ALEXANDER M. PATCH	Transport

AMERICAN BANKER	Freighter	GEN. MAURICE ROSE	Transport
ALBION VICTORY	Freighter	GEN. NELSON M. WALKER	Transport
AMERICAN VICTORY*	Freighter	GEN. SIMON B. BUCKNER	Transport
ANCHORAGE VICTORY	Freighter	ALLENDALE	Transport
BEATRICE VICTORY	Freighter	GAGE	Transport
BESSEMER VICTORY	Freighter	LAUDERDALE	Transport
CATAWBA VICTORY	Freighter	LAURENS	Transport
C.C.N.Y. VICTORY	Freighter	LAVACA	Transport
CLARKSVILLE VICTORY	Freighter	MOUNTRAIL	Transport
CORNELL VICTORY	Freighter	SANCTUARY	AH
DENISON VICTORY	Freighter	GOPHER STATE*	T-ACS
DUKE VICTORY	Freighter	KEYSTONE STATE*	T-ACS
DURANGO VICTORY	Freighter	KINGSPORT	AG
ELKO VICTORY	Freighter	PROTECTOR	AGR
GREELEY VICTORY	Freighter	CASA GRANDE	LSD
GRETNA VICTORY	Freighter	DONNER	LSD
HALAULA VICTORY	Freighter	RUSHMORE	LSD
HARVARD VICTORY	Freighter	WOOD COUNTY	LST
HOBART VICTORY	Freighter	WEST MILTON	ARD
LAFAYETTE VICTORY	Freighter	CRANDALL	YHLC
LAREDO VICTORY	Freighter	CRILLEY	YHLC
LYNN VICTORY	Freighter	ESSAYONS	Dredge
MANDERSON VICTORY	Freighter	GOETHALS	Dredge
		STURGIS	MH-1A

*Ready Reserve Force (RRF) Vessels

RO/RO - Roll-On/Roll-Off

BEAUMONT

JOHN HENRY	Heavy Lift	MEACHAM	Tanker
CAPE*	Freighter	NAECO	Tanker
GULF BANKER*	Freighter	PRIDE II	Tanker
GULF FARMER*	Freighter	TEXACO MARYLAND	Tanker
GULF MERCHANT*	Freighter	MT. WASHINGTON	Tanker
GULF SHIPPER*	Freighter	MISSION BEUNAVENTURE*	Tanker
GULF TRADER*	Freighter	BEAUJOLAIS	Tanker
CAPE CHALMERS*	Freighter	CHESAPEAKE	Tanker
CAPE CHARLES*	Freighter	OCEANPORT	Barge
CAPE CLEAR*	Freighter	HANNAH 6301	Barge
CAPE COD*	Freighter	KARA SEAL	Offshore Supply
BUYER	Freighter	RED SEAL	Offshore Supply
DEL MONTE*	Freighter	BLACK SEAL	Offshore Supply
DEL VALLE*	Freighter	RED RIVER	Offshore Supply
DEL VIENTO*	Freighter	STATE COMMAND	Offshore Supply
SANTA ANA*	Freighter	TRINITY RIVER	Offshore Supply
PIONEER COMMANDER*	Freighter	STATE EBONY	Offshore Supply
PIONEER CONTRACTOR*	Freighter	STATE HAWK	Offshore Supply
PIONEER CRUSADER*	Freighter	LEAM ALABAMA	Offshore Supply
BRINTON LYKES	Freighter	LEAM CALIFORNIA	Offshore Supply
AMERICAN ALTAIR	Part. Cont.	LEAM FLORIDA	Offshore Supply
AMERICAN DRACO	Part. Cont.	LEAM LOUISIANA	Offshore Supply
AMERICAN RESERVIST	Part. Cont.	LEAM MISSISSIPPI	Offshore Supply
CAPE INSPRIPTION*	RO/RO	LEAM TEXAS	Offshore Supply
CAPE FLORIDA*	LASH	MARSEA ONE	Offshore Supply
CAPE MAY*	SEABEE	MARSEA TWO	Offshore Supply
CAPE MENDOCINO*	SEABEE	MARSEA THREE	Offshore Supply
CAPE MOHICAN*	SEABEE	MARSEA FOUR	Offshore Supply
BENJAMIN HARRISON	LAST	MARSEA FIVE	Offshore Supply
CAPE FAREWELL*	LAST	MARSEA SIX	Offshore Supply
CAPE FLATTERY*	LAST	MARSEA SEVEN	Offshore Supply
EDWARD RUTLEDGE	LAST	MARSEA NINE	Offshore Supply
ALLEGHENY VICTORY	Freighter	POINT CHRISTIE	Offshore Supply
AMARILLO VICTORY	Freighter	POINT HOPE	Offshore Supply
ASBURY VICTORY	Freighter	AGILE	Offshore Supply
BATTLE CREEK VICTORY	Freighter	LOUISE PELHAM	Offshore Supply
CANTON VICTORY	Freighter	LYNN PELHAM	Offshore Supply
CITADEL VICTORY	Freighter	NOLA PELHAM	Offshore Supply
DRAKE VICTORY	Freighter	TOP FLIGHT	Offshore Supply
ENID VICTORY	Freighter	FURMAN	Freighter
HATTIESBURG VICTORY*	Freighter	SCHUYLKILL	Tanker
HIGH POINT VICTORY	Freighter	AMERICAN EXPLORER*	Tanker
PINE BLUFF VICTOR"	Freighter	YUKON	Tanker
PRINCETON VICTORY	Freighter	POTOMAC*	Tanker

SAN MATEO VICTORY	Freighter	MAUMEE	Tanker
TUCSON VICTORY	Freighter	ACHOMAWI	Tug
WHITTIER VICTORY	Freighter	CHIPPEWA	Tug
BELGIUM VICTORY	Freighter	NARRAGANSETT	Tug
GAINESVILLE VICTORY	Freighter	WENATCHEE	Tug
WASHINGTON*	Part. Cont.	GERIG	Dredge
MAINE*	Part. Cont.	LANGFITT	Dredge
OHIO	Part. Cont.	BOWDITCH	T-AGS
AMERICAN OSPREY	Tanker	BRAZOS	Tanker
CHANCELLORSVILLE	Tanker		

*Ready Reserve Force (RRF) Vessels

APPENDIX B
Ready Reserve Fleet as of 31 December 1987
Location - Ship Types - Age - DWT
[Ref. 18]

SUISUN BAY - Total 21

Name	Type	Age	DWT
Cape Borda	Breakbulk	21	14,662
CapBreton	Breakbulk	21	14,662
Cape Bon	Breakbulk	21	14,662
Cape Bover	Breakbulk	21	14,662
Cape Blanco	Breakbulk	22	14,662
California	Breakbulk	26	14,349
Austral Lightning	LASH	17	29,820
Cape Ducato	RO/RO	16	21,398
Cape Edmont (ex-Paralla)	RO/RO	17	20,225
Cape Horn	RO/RO	9	20,870
Jupiter	RO/RO	12	20,160
Cape Isabel	RO/RO	--	20,160
Comet	RO/RO	30	10,111
Northern Light	Breakbulk	27	12,537
Meteor	RO/RO	21	12,326
ALatna	Tanker	31	4,933
Chattahoochee	Tanker	31	4,933
Nodaway	Tanker	43	4,000
Shoshone	Tanker	31	26,943
Gem State	AUX Crane	22	13,600
Grand Canyon State	AUX Crane	--	13,600

BEAUMONT - Total 31

Cape Catawba	Breakbulk	28	12,673
Gulf Banker	Breakbulk	24	11,368
Gulf Farmer	Breakbulk	24	11,368
Gulf Merchant	Breakbulk	23	11,368
Gulf Shipper	Breakbulk	24	11,368
Gulf Trader	Breakbulk	24	11,368
Cape Chalmers	Breakbulk	25	11,368
Cape Charles	Breakbulk	25	12,684
Cape Clear	Breakbulk	25	12,684
Cape Cod	Breakbulk	25	12,684
Del Monte	Breakbulk	20	13,039
Del Valle	Breakbulk	20	13,039
Del Viento	Breakbulk	20	13,039
Santa Ana	Breakbulk	36	14,376
Pioneer Commander	Breakbulk	25	13,535
Pioneer Contracter	Breakbulk	25	13,535
Pioneer Crusader	Breakbulk	25	13,535

AD-A200 201 AN EXAMINATION OF THE OUTPORTING SHIP PROGRAM IMPLEMENTED IN RESPONSE TO T..(U) NAVAL POSTGRADUATE SCHOOL MONTEREY CA J M MCFARLAND JUN 88 2/2

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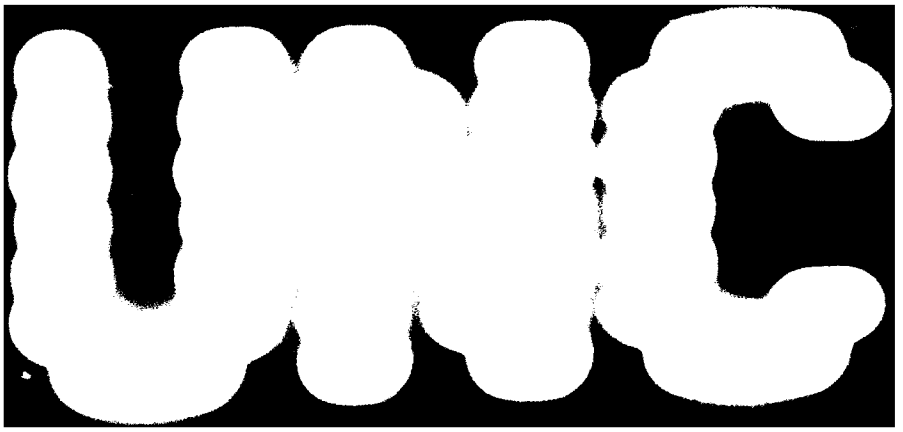
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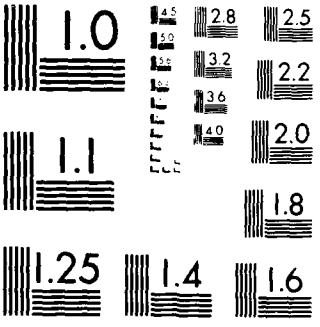

Cape Inscription	RO/RO	12	20,160
Cape Florida	LASH	17	29,820
Cape May	SEABEE	16	38,410
Cape Mendocino	SEABEE	16	38,410
Cape Mohican	SEABEE	15	38,410
Cape Farewell	LASH	15	40,370
Cape Flattery	LASH	15	40,370
Hattiesburg Victory	Breakbulk	43	10,700
Washington	SEATRAIN	44	12,292
Maine	SEATRAIN	44	12,312
American Osprey	Tanker	30	34,723
Mission Buenaventura	Tanker	20	38,238
American Explorer	Tanker	29	24,226
Potomac	Tanker	31	27,467

JAMES RIVER - Total 38

Lake	Breakbulk	27	12,476
Pride	Breakbulk	28	12,402
Scan	Breakbulk	27	12,483
Cape Canaveral	Breakbulk	24	12,684
Cape Canso	Breakbulk	25	12,684
Cape Catoche	Breakbulk	25	12,684
Cape Carthage	Breakbulk	25	12,684
Aide	Breakbulk	28	11,021
Agent	Breakbulk	27	11,089
Adventurer	Breakbulk	28	10,986
Ambassador	Breakbulk	28	10,986
Banner	Breakbulk	27	12,629
Courier	Breakbulk	27	12,705
Santa Barbara	Breakbulk	21	12,693
Santa Clara	Breakbulk	22	12,624
Santa Cruz	Breakbulk	22	12,631
Santa Elena	Breakbulk	21	12,678
Santa Isabel	Breakbulk	21	12,472
Santa Lucia	Breakbulk	20	12,693
Cape Alava	Breakbulk	26	12,728
Cape Alexander	Breakbulk	26	12,728
Cape Ann	Breakbulk	26	12,728
Cape Archway	Breakbulk	25	12,728
Cape Avinof	Breakbulk	25	12,728
Cape Nome	Breakbulk	19	15,690
American Victory	Breakbulk	43	10,700
Cape Decision	RO/RO	15	21,398
Cape Diamond	RO/RO	16	21,398
Cape Domingo	RO/RO	15	21,398
Cape Douglas	RO/RO	15	21,398
Cape Henry	RO/RO	9	20,870
Cape Hudson	RO/RO	9	20,870
Cape Lambert	RO/RO	15	19,803
Patriot State	Troopship	24	8,759
Southern Cross	Breakbulk	26	12,519

Adm. Wm. M. Callaghan		RO/RO	2113,500
Gopher State	AUX Crane	15	11,068
Keystone State	AUX Crane	22	13,600

APPENDIX C

Name, Location, Type, Dwt Of Outported RRF Ships as of 31 December 1987 [Ref. 26]

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WEST COAST - TOTAL 20

NDRF site: Suisun Bay, California

Name	Outported Location	Type	DWT
Cape Borda	Richmond, CA	BB	14,662
Cape Breton	San Francisco, CA	BB	14,662
Cape Bon	San Pedro, CA	BB	14,662
Cape Bover	Richmond, CA	BB	14,662
Cape Blanco	Tacoma, WA	BB	14,662
California	Alameda, CA	BB	14,349
Austral Lightning	San Francisco, CA	LASH	29,820
Cape Ducato	San Pedro, CA	RO/RO	21,398
Cape Edmond	Portland, OR	RO/RO	20,225
Cape Horn	San Francisco, CA	RO/RO	20,870
Jupiter	Tacoma, WA	RO/RO	20,160
Cape Isabel	Portland, OR	RO/RO	20,160
Comet	Portland, OR	RO/RO	10,111
Northern Light	Portland, OR	BB	12,537
Meteor	Terminal Is., CA	RO/RO	12,326
Alatna	Yokohama, Japan	Tanker	4,933
Chattahoochee	Yokohama, Japan	Tanker	4,933
Nodaway	Honolulu, HI	Tanker	4,000
Gem State	Tacoma, WA	TACS	13,600
Grand Canyon State	Portland, OR	TACS	13,600

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GULF COAST - TOTAL 7

NDRF site: Beaumont, Texas

Cape Inscription	Violet, LA	RO/RO	20,160
Cape Florida	Mobile, AL	LASH	29,820
Cape May	Violet, LA	SEABEE	38,410
Cape Mendocino	Violet, LA	SEABEE	38,410
Cape Mohican	New Orleans, LA	SEABEE	38,410
Cape Farewell	Mobile, AL	LASH	40,370
Cape Flattery	Mobile, AL	LASH	40,370

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EAST COAST - TOTAL 21

NDRF site: James River

Name	Outported Location	Type	DWT
Lake	Philadelphia, PA	BB	12,476
Pride	Philadelphia, PA	BB	12,402
Scan	Philadelphia, PA	BB	12,483
Cape Canaveral	Portland, ME	BB	12,684
Cape Canso	Portsmouth, VA	BB	12,684
Cape Catoche	Providence, RI	BB	12,684
Cape Carthage	Melville, RI	BB	12,684
Aide	Quonset Point, RI	BB	11,021
Ambassador	Cheatham Annex, VA	BB	10,986
Cape Alexander	Jacksonvill, FL	BB	12,728
Cape Ann	Quonset Point, RI	BB	12,728
Cape Archway	Baltimore, MD	BB	12,728
Cape Avinof	Quonset Point, RI	BB	12,728
Cape Decision	Baltimore, MD	RO/RO	21,398
Cape Diamond	Brooklyn, NY	RO/RO	21,398
Cape Domingo	Brooklyn, NY	RO/RO	21,398
Cape Douglas	Jacksonville, FL	RO/RO	21,398
Patriot State	Buzzards Bay, MA	Troopship	8,759
Southern Cross	Philadelphia, PA	BB	12,519
Gopher State	Cheatham Annex, VA	TAC	11,068
Keystone State	Cheatham Annex, VA	TAC	13,600

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APPENDIX D
Readiness Status of Outported RRF Ships
[Ref. 38]

West Coast Name	Location	Readiness Status - Days	
Cape Borda	CA	5	
Cape Breton	CA	5	
Cape Bon	CA	5	
Cape Bover	CA	5	
Cape Blanco	WA	5	
California	CA	5	
Austral Lightning	CA	5	
Cape Ducato	CA	5	
Cape Edmont	OR	5	
Cape Horn	CA	5	
Jupiter	WA	5	
Cape Isabel	OR	5	
Comet	OR	5	
Northern Light	OR	5	
Meteor	CA	5	
Alatna	Japan	10	
Chattahoochee	Japan	10	
Nodaway	HI	10	
Gem State	WA	5	
Grand Canyon State	OR	5	
NDRF Site			
Shoshone			10
GULF COAST			
Cape Inscription	LA	5	
Cape Florida	AL	5	
Cape May	LA	5	
Cape Mendocino	LA	5	
Cape Mohican	LA	5	
Cape Farewell	AL	5	
Cape Flattery	AL	5	
NDRF Site			
Cape Catawba			10
Gulf Banker			10
Gulf Farmer			10
Gulf Merchant			10
Gulf Shipper			5

Name	Location	Readiness Status - Days
Gulf Trader		5
Cape Chalmers		10
Cape Charles		10
Cape Clear		10
Cape Cod		10
Del Monte		5
Del Valle		10
Del Viento		5
Santa Ana		10
Pioneer Commander		10
Pioneer Contracter		10
Pioneer Crusader		10
Hattiesburg Victory		10
Washington		10
Maine		10
American Osprey		5
Mission Buenaventura		5
American Explorer		10
Potomac		5
**********	**********	**********
EAST COAST		
Lake	PA	5
Pride	PA	5
Scan	PA	5
Cape Canaveral	ME	5
Cape Canso	VA	5
Cape Catoche	RI	5
Cape Carthage	RI	5
Aide	RI	10
Ambassador	VA	10
Cape Alexander	FL	5
Cape Ann	RI	5
Cape Archway	MD	5
Cape Avinof	RI	5
Cape Decision	MD	5
Cape Diamond	NY	5
Cape Domingo	NY	5
Cape Douglas	FL	5
Patriot State	MA	5
Southern Cross	PA	5
Gopher State	VA	5
Keystone State	VA	5
NDRF Site		
Agent		5
Adventurer		10

Name	Location	Readiness Status - Days
Banner		10
Courier		10
Santa Barbara		20
Santa Clara		20
Santa Cruz		20
Santa Elena		20
Santa Isabel		20
Santa Lucia		20
Cape Alava		5
Cape Nome		5
American Victory		10
Cape Henry		5
Cape Hudson		5
Cape Lambert		5
Adm. Wm. M. Callaghan		20

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